This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

The Gift of

WILLIAM H. BUTTS, Ph.D.

A.B. 1878 A.M. 1879

Teacher of Mathematics

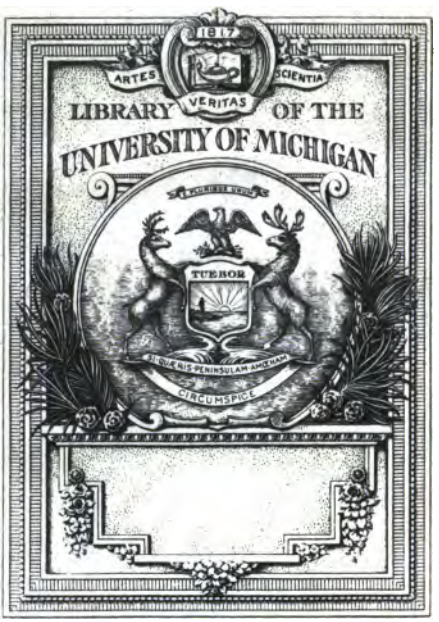
1898 to 1922

Assistant Dean, College of Engineering

1908 to 1922

Professor Emeritus

1922


1817
ARTES
SCIENTIA
VERITAS
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
TUEBOR
CIRCUMSPICE

T. B. (Bayley. 17
Acad. Edi

A TREATISE OF PRACTICAL GEOMETRY.

IN THREE PARTS.

By the late Dr. DAVID GREGORY,
Sometime Professor of Mathematicks in the University of EDINBURGH, and afterwards *Savilian* Professor of Astronomy at OXFORD.

[*Translated from the* Latin. *With Additions.*]

The FOURTH EDITION.

EDINBURGH:
Printed by HAMILTON, BALFOUR, and NEILL.
M,DCC,LXI.

WH Butts math. fd.
Bowes
2-4-37
33330

PREFACE.

02-5-37 MEW

THIS Treatiſe was compoſed in *Latin* about ſixty Years ago by Dr. DAVID GREGORY, then Profeſſor of Mathematicks in the Univerſity of *Edinburgh*; where it has been conſtantly taught ſince that Time, immediately after *Euclid*'s Elements and the plain Trigonometry, as proper for exerciſing the Students in the Application of Geometry to Practice. The Bookſeller

Bookſeller having procured an *Engliſh* Tranſlation of it, which had been made by an ingenious Gentleman when a Student here, this Tranſlation has been reviſed; and ſeveral Additions have been made to the Treatiſe itſelf, in order to render it more uſeful at this Time. The Reader will find theſe diſtinguiſhed from the Author's Text.

COL. M^c LAURIN.

College of EDINB.
May 1. 1745.

A

TREATISE

OF

Practical Geometry.

HAVING explained the firſt ſix books of *Euclid*, with the eleventh and twelfth, which may ſerve for geometrical elements; and having alſo taught the plain Trigonometry; we are now to ſubjoin ſome corollaries which are eaſily deduced from them, that contain practical rules of great uſe in the affairs of life, concerning the menſuration of lines, angles, ſurfaces, and ſolids.

This treatiſe of practical Geometry is divided into three parts. In the firſt, we treat of the menſuration of lines and angles; to which we have ſubjoined Surveying. In the ſecond, we treat of ſurfaces; not of ſuch as are plain only, but of ſome curve ſurfaces

likewiſe; as of the ſurface of the cylinder, cone, and ſphere; and of thoſe parts of the ſphere which we have frequently occaſion to conſider. It is ſhewn how to expreſs the area of theſe in the ſuperficial meaſures that are now in uſe amongſt us. The third part treats of ſolid figures and their menſuration. After deducing the rules for finding the ſolid content of the parallelopipedon, priſm, pyramid, cylinder, cone, *&c.* from *Euclid*; we add, from *Archimedes*, the menſuration of the ſphere and ſpheroid, and of their ſegments, demonſtrated in an eaſy manner; from whence a method is derived for finding the contents of veſſels that are either full, or in part empty, in the wet, as well as the dry meaſures, that are now in uſe amongſt us.

PART I.

A Line, or length, to be meaſured, whether it be diſtance, height, or depth, is meaſured by a line leſs than it. With us the leaſt meaſure of length is an inch: not that we meaſure no line leſs than it, but becauſe we do not uſe the name of any meaſure below

below that of an inch; expreſſing leſſer meaſures by the fractions of an inch: and in this treatiſe we uſe decimal fractions as the eaſieſt. Twelve inches make a foot; three feet and an inch make the *Scots* ell; ſix ells make a fall; forty falls make a furlong; eight furlongs make a mile: So that the *Scots* mile is 1184 paces, accounting every pace to be five feet. Theſe things are according to the ſtatutes of *Scotland*; notwithſtanding which, the glaziers uſe a foot of only eight inches; and other artiſts for the moſt part uſe the *Engliſh* foot, on account of the ſeveral ſcales marked on the *Engliſh* foot-meaſure for their uſe. But the *Engliſh* foot is ſomewhat leſs than the *Scots*; ſo that 185 of theſe, make 186 of thoſe.

Lines, to the extremities and any intermediate point of which you have eaſy acceſs, are meaſured by applying to them the common meaſure a number of times. But lines, to which you cannot have ſuch acceſs, are meaſured by methods taken from Geometry. The chief whereof we ſhall here endeavour to explain. The firſt is by the help of the Geometrical ſquare.

" As for the *Engliſh* meaſures, the yard is " three feet, or thirty-ſix inches. A pole is " ſixteen feet and a half, or five yards and a " half. The chain, commonly called *Gunter's* " *chain*, is four poles, or twenty-two yards, " that is ſixty ſix feet. An *Engliſh* ſtatute " mile is fourſcore chains, or 1760 yards, " that is, 5280 feet.

" The chain (which is now much in uſe, " becauſe it is very convenient for ſurveying) " is divided into a hundred links, each of " which is $7\frac{92}{100}$ of an inch: whence it is " eaſy to reduce any number of thoſe links " to feet, or any number of feet to links.

" A chain that may have the ſame advan- " tages in ſurveying in *Scotland*, as *Gunter's* " chain has in *England*, ought to be in length " ſeventy four feet, or twenty four *Scots* ells, " if no regard is had to the difference of the " *Scots* and *Engliſh* foot above mentioned. " But, if regard is had to that difference, the " *Scots* chain ought to conſiſt of $74\frac{4}{5}$ *Engliſh* " feet, or 74 feet 4 inches and $\frac{4}{5}$ of an inch. " This chain being divided into an hundred " links, each of thoſe links is 8 inches and " $\frac{928}{1000}$ of an inch. In the following table,

" the

" the moſt noted meaſures are expreſſed in " *Engliſh* inches and decimals of an inch."

	Engliſh Inch.	*Dec.*
The *Engliſh* foot, is - -	12	000
The *Paris* foot, - - -	12	788
The *Rhinland* foot, meaſured by Mr *Picart*, - - -	12	362
The *Scots* foot, - - -	12	065
The *Amſterdam* foot, by *Snellius* and *Picart*, - - -	11	172
The *Dantzick* foot, by *Hevelius*,	11	297
The *Daniſh* foot, by Mr *Picart*,	12	465
The *Swediſh* foot, by the ſame,	11	692
The *Bruſſels* foot, by Mr *Picart*,	10	828
The *Lyons* foot, by Mr *Auzout*,	13	458
The *Bononian* foot, by Mr *Caſſini*,	14	938
The *Milan* foot, by Mr *Auzout*,	15	631
The *Roman* palm uſed by merchants, according to the ſame, -	9	791
The *Roman* palm uſed by architects,	8	779
The palm of *Naples*, according to Mr *Auzout*, - -	10	314
The *Engliſh* yard, - - -	36	000
The *Engliſh* ell, - - -	45	000
The *Scots* ell, - - -	37	200

The

	Inch.	Dec.
The *Paris* aune uſed by mercers, according to Mr *Picart*,	46	786
The *Paris* aune uſed by drapers, according to the ſame,	46	680
The *Lyons* aune, by Mr *Auzout*,	46	570
The *Geneva* aune, - -	44	760
The *Amſterdam* ell, - -	26	800
The *Daniſh* ell, by Mr *Picart*,	24	930
The *Swediſh* ell, - - -	23	380
The *Norway* ell, - - -	24	510
The *Brabant* or *Antwerp* ell, -	27	170
The *Bruſſels* ell, - - -	27	260
The *Bruges* ell, - - -	27	550
The brace of *Bononia*, according to *Auzout*, - -	25	200
The brace uſed by architects in *Rome*,	30	730
The brace uſed in *Rome* by merchants,	34	270
The *Florence* brace uſed by merchants, according to *Picart*,	22	910
The *Florence* geographical brace,	21	570
The vara of *Seville*, - - -	33	127
The vara of *Madrid*, - -	39	166
The vara of *Portugal*, - -	44	031
The cavedo of *Portugal*, -	27	354
The ancient *Roman* foot, -	11	632

The

	Inch.	Dec.
The *Perſian* ariſh, according to Mr *Greaves*,	38	364
The ſhorter pike of *Conſtantinople*, according to the ſame,	25	576
Another pike of *Conſtantinople*, according to Meſſ. *Mallet* and *De la Porte*,	27	920

PROPOSITION I.

PROBLEM I.

To deſcribe the ſtructure of the Geometrical ſquare.

THE Geometrical ſquare is made of any ſolid matter, as braſs or wood, or of any four plain rulers joined together at right angles, (as in Fig. 1.); where A is the centre, from which hangs a thread with a ſmall weight at the end, ſo as to be directed always to the centre. Each of the ſides BE and DE is divided into an hundred equal parts, or (if the ſides be long enough to admit of it) into a thouſand parts; C and F are two ſights, fixed on the ſide AD. There is moreover an index

index GH, which, when there is occaſion, is joined to the centre A, in ſuch manner as that it can move round, and remain in any given ſituation. On this index are two ſights perpendicular to the right line going from the centre of the inſtrument; theſe are K and L. The ſide DE of the inſtrument is called the upright ſide; BE the reclining ſide.

PROP. II. FIG. 2.

To meaſure an acceſſible height, AB, *by the help of a Geometrical ſquare, its diſtance being known.*

LET BR be an horizontal plain, on which there ſtands perpendicularly any line AB: Let BD, the given diſtance of the obſervator from the height, be 96 feet; let the height of the obſervator's eye be ſuppoſed 6 feet; and let the inſtrument held by a ſteady hand, or rather leaning on a ſupport, be directed towards the ſummit A, ſo that one eye (the other being ſhut) may ſee it clearly through the ſights; the perpendicular or plum-line mean while hanging free, and touching the ſurface of the inſtrument: Let now the perpendicular

pendicular be ſuppoſed to cut off on the right ſide KN 80 equal parts. It is clear that LKN, ACK, are ſimilar triangles; for the angles LKN, ACK, are right angles, and therefore equal: moreover LN and AC are parallel, as being both perpendicular to the horizon; conſequently, by *Prop.* 29. 1. *B.* of *Euclid*, the angles KLN, KAC, are equal; wherefore, by the ſecond corollary and of the 32. *Prop.* 1. *B.* of *Euclid*, the angles LNK, and AKC, are likewiſe equal: ſo that in the triangles NKL, KAC, (by the 4. *Prop.* 6f the 6. *B.* of *Euclid*), as NK : KL : : KC (*i. e.* BD) : CA; that is, as 80 to 100, ſo is 96 feet to CA. Therefore, by the rule of three, CA will be found to be 120 feet; and CB, which is 6 feet, being added, the whole height is 126 feet.

But if the diſtance of the obſervator from the height, as BE, be ſuch, that, when the inſtrument is directed as formerly toward the ſummit A, the perpendicular fall on the angle P, oppoſite to H, the centre of the inſtrument, and BE or CG be given of 120 feet; CA will alſo be 120 feet. For in the triangles HGP, ACG, equiangular,

as in the preceeding caſe, as PG : GH : : GC : CA. But PG is equal to GH; therefore GC is likewiſe equal to CA: that is, CA will be 120 feet, and the whole height 126 feet as before.

Let the diſtance BF be 300 feet, and the perpendicular or plum-line cut off 40 equal parts from the reclining ſide: Now, in this caſe, the angles QAC, QZI, are equal, by the 29. *Prop.* 1. *B.* of *Euclid.* And, by the ſame *Prop.* the angles QZI, ZIS, are equal; therefore the angle ZIS, is equal to the angle QAC. But the angles ZSI, QCA are equal, being right angles; therefore in the æquiangular triangles ACQ, SZI, by the 4. *Prop.* of the 6. *B.* of *Euclid*, it will be, as ZS : SI : : CQ : CA; that is, as 100 to 40, ſo is 300 to CA. Wherefore, by the rule of three, CA will be found to be of 120 feet. And, by adding the height of the obſervator, the whole BA will be 126 feet. Note, That the height is greater than the diſtance, when the perpendicular cuts the right ſide, and leſs, if it cut the reclined ſide; and that the height and diſtance are equal, if the perpendicular fall on the oppoſite angle.

SCHOLIUM.

SCHOLIUM. Fig. 3.

If the height of a tower, to be meaſured as above, end in a point, as in Fig. 3. the diſtance of the obſervator oppoſite to it, is not CD, but is to be accounted to the perpendicular from the point A; that is, to CD muſt be added the half of the thickneſs of the tower, *viz.* BD: Which muſt likewiſe be underſtood in the following Propoſitions, when the caſe is ſimilar.

PROP. III.

Prob. Fig. 4.

From the height of a tower AB *given, to find a diſtance on the horizontal plane* BC, *by the Geometrical ſquare.*

LET the inſtrument be ſo placed, as that the mark C in the oppoſite plane may be ſeen through the ſights; and let it be obſerved how many parts are cut off by the perpendicular. Now, by what hath been already demonſtrated, the triangles AEF, ABC, are ſimilar; therefore, by 4th, 6. *Eucl.*

it

it will be as EF, to AE, ſo AB (compoſed of the height of the tower BG, and of the height of the centre of the inſtrument A, above the tower BG) to the diſtance BC. Wherefore, if, by the rule of three, you ſay, as EF to AE, ſo is AB to BC, it will be the diſtance ſought.

PROP. IV. FIG. 5.

To meaſure any diſtance at land or ſea, by the Geometrical ſquare.

IN this operation, the index is to be applied to the inſtrument, as was ſhown in the deſcription; and, by the help of a ſupport, the inſtrument is to be placed horizontally at the point A; then let it be turned till the remote point F, whoſe diſtance is to be meaſured, be ſeen through the fixed ſights: and bringing the index to be parallel with the other ſide of the inſtrument, obſerve by the ſights upon it any acceſſible mark B, at a ſenſible diſtance; then carrying the inſtrument to the point B, let the immoveable ſights be directed to the firſt ſtation A, and the ſights of the index to the point F.

If

If the Index cut the right ſide of the ſquare, as in K, in the two triangles BRK, and BAF, which are æquiangular, it will be (by 4th 6. *Eucl.*) as BR to RK, ſo BA (the diſtance of the ſtations to be meaſured with a chain) to AF; and the diſtance AF ſought will be found by the rule of three. But if the index cut the reclined ſide of the ſquare in any point L, where the diſtance of a more remote point is ſought; in the triangles BLS, BAG, the ſide LS ſhall be to SB, as BA to AG, the diſtance ſought; which accordingly will be found by the rule of three.

PROP. V.

PROB. FIG. 6.

To meaſure an acceſſible height by means of a plain Mirror.

LET AB be the height to be meaſured; let the Mirror be placed at C, in the horizontal plane BD, at a known diſtance BC: let the obſerver go back to D, till he ſee the image of the ſummit in the Mirror, at a certain point of it, which he muſt diligently mark; and let DE be the height of the obſervator's eye. The triangles ABC

ABC and EDC are æquiangular; for the angles at D and B are right angles; and ACB, ECD, are equal, being the angles of incidence and reflexion of the ray AC, as is demonſtrated in optics; wherefore the remaining angles at A, and E, are alſo equal: Therefore, by 4th, 6. *Eucl.* it will be, as CD to DE, ſo CB to BA; that is, as the diſtance of the obſervator from the point of the Mirror in the right line betwixt the obſervator and the height, is to the height of the obſervator's eye, ſo is the diſtance of the tower from that point of the Mirror, to the height of the tower ſought; which therefore will be found by the rule of three.

Note 1. The obſervator will be more exact, if, at the point D, a ſtaff be placed in the ground perpendicularly, over the top of which the obſervator may ſee a point of the glaſs exactly in a line betwixt him and the tower.

Note 2. In place of a mirror may be uſed the ſurface of water contained in a veſſel, which naturally becomes parallel to the horizon.

PROP.

PROP. VI. FIG. 7.

To meaſure an acceſſible height AB *by means of two ſtaffs.*

LET there be placed perpendicularly in the ground a longer ſtaff DE, likewiſe a ſhorter one FG, ſo as the obſervator may ſee A, the top of the height to be meaſured, over the ends D, F, of the two ſtaffs; let FH and DC, parallel to the horizon, meet DE and AB in H and C; then the triangles FHD, DCA, ſhall be æquiangular; for the angles at C and H are right ones; likewiſe the angle A, is equal to the angle FDH, by 29. 1. *Eucl.*; wherefore the remaining angles DFH, and ADC, are alſo equal: wherefore, by 4. 6. *Eucl.* as FH, the diſtance of the ſtaffs, to HD, the exceſs of the longer ſtaff above the ſhorter; ſo is DC, the diſtance of the longer ſtaff from the tower, to CA, the exceſs of the height of the tower above the longer ſtaff. And thence CA will be found by the rule of three.

To which if the length DE be added, you will have the whole height of the tower BA. Q. E. F.

SCHO-

SCHOLIUM. Fig. 8.

Many other methods may be occaſionally contrived for meaſuring an acceſſible height. For example, from the given length of the ſhadow BD, I find out the height AB, thus: Let there be erected a ſtaff CE perpendicularly, producing the ſhadow EF: the triangles ABD, CEF, are æquiangular; for the angles at B, and E, are right; and the angles ADB, and CFE, are equal, each being equal to the angle of the ſun's elevation above the horizon: therefore, by 4th, 6. *Eucl.* as EF the ſhadow of the ſtaff, to EC the ſtaff itſelf, ſo BD the ſhadow of the tower, to BA the height of the tower. Though the plane on which the ſhadow of the tower falls be not parallel to the horizon, if the ſtaff be erected in the ſame plane, the rule will be the ſame.

PROP. VII.

To meaſure an inacceſſible height by means of two ſtaffs.

HITHERTO we have ſuppoſed the height to be acceſſible, or that we can come at the lower end of it: now if, becauſe of ſome

ſome impediment, we cannot get to a tower, or if the point whoſe height is to be found out, be the ſummit of a hill, ſo that the perpendicular be hid within the hill; if, I ſay, for want of better inſtruments, ſuch an inacceſſible height is to be meaſured by means of two ſtaffs, let the firſt obſervation be made with the ſtaffs DE and FG, as in *Prop.* I.; then the obſervator is to go off in a direct line from the height and firſt ſtation, till he come to the ſecond ſtation; where he is to place the longer ſtaff perpendicularly at RN, and the ſhorter ſtaff at KO, ſo that the ſummit A may be ſeen along their tops; that is, ſo that the points KNA may be in the ſame right line. Through the point N let there be drawn the right line NP parallel to FA: Wherefore in the triangles KNP, KAF, the angles KNP, KAF are equal, by the 29. 1. *Eucl.* alſo the angle AKF is common to both; conſequently the remaining angle KPN, is equal to the remaining angle KFA. And therefore, by 4th, 6. *Eucl.* PN : FA : : KP : KF. But the triangles PNL, FAS are ſimilar; therefore, by 4th, 6. *Eucl.*

PN : FA : : NL : SA. Therefore, by the 11. 5. *Eucl.* KP : KF : : NL : SA. Thence, alternately, it will be, as KP (the exceſs of the greater diſtance of the ſhort ſtaff from the long one above its leſſer diſtance from it) to NL, the exceſs of the longer ſtaff above the ſhorter; ſo KF, the diſtance of the two ſtations of the ſhorter ſtaff, to SA, the exceſs of the height ſought above the height of the ſhorter ſtaff. Wherefore SA will be found by the rule of three. To which let the height of the ſhorter ſtaff be added, and the ſum will give the whole inacceſſible height BA. Q. E. F.

Note 1. In the ſame manner may an inacceſſible height be found by a Geometrical ſquare, or by a plain Speculum. But we ſhall leave the rules to be found out by the ſtudent, for his own exerciſe.

Note 2. That by the height of the ſtaff we underſtand its height above the ground in which it is fixed.

Note 3. Hence depends the method of uſing other inſtruments invented by Geometricians; for example, of the Geometrical croſs: And if all things be juſtly weighed,

a like rule will ſerve for it as here. But we incline to touch only upon what is moſt material.

PROP. VIII. FIG. 9.

To meaſure the diſtance AB, *to one of whoſe extremities we have acceſs, by the help of four ſtaffs.*

LET there be a ſtaff fixed at the point A; then going back at ſome ſenſible diſtance in the ſame right line, let another be fixed in C, ſo as that both the points A and B be covered and hid by the ſtaff C: likewiſe going off in a perpendicular from the right line CB, at the point A, (the method of doing which ſhall be ſhown in the following *Scholium*), let there be placed another ſtaff at H; and in the right line CKG (perpendicular to the ſame CB, at the point C), and at the point of it K, ſuch that the points K, H, and B, may be in the ſame right line, let there be fixed a fourth ſtaff. Let there be drawn, or let there be ſuppoſed to be drawn, a right line HG parallel to CA. The triangles KHG, HAB will be æquiangular; for the angles HAB, KGH are right angles. Alſo, by

29th,

29th, 1. *Eucl.* the angles ABH, KHG are equal: wherefore, by the 4th, 6. *Eucl.* as KG (the exceſs of CK above AH) to GH, or to CA, the diſtance betwixt the firſt and ſecond ſtaff; ſo is AH, the diſtance betwixt the firſt and third ſtaff, to AB the diſtance ſought.

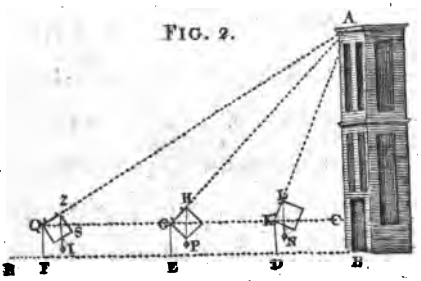
SCHOLIUM. FIG. 10.

To draw on a plane a right line AE perpendicular to CH, from a given point A; take the right lines AB, AD, on each ſide equal; and in the points B and D, let there be fixed ſtakes, to which let there be tied two equal ropes BE, DE, (or one having a mark in the middle, and holding in your hand their extremities joined, (or the mark in the middle, if it be but one), draw out the ropes on the ground; and then, where the two ropes meet, or at the mark, when by it the rope is fully ſtretched, let there be placed a third ſtake at E; the right line AE will be perpendicular to CH in the point A, by 11th, 1. *Eucl.* In a manner not unlike to this may any problems that are reſolved by the ſquare and compaſſes, be done by ropes and a cord turned round as a radius.

PROP.

FIG. 1.

FIG. 2.



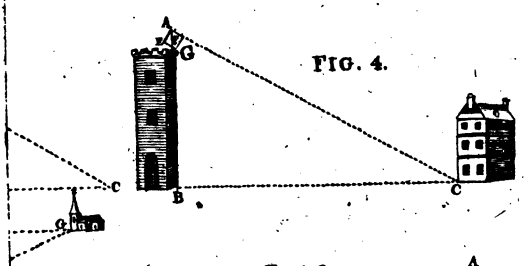


FIG. 4.

FIG. 6.

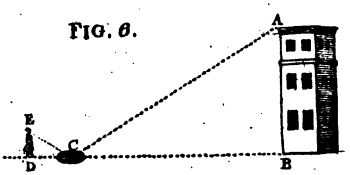


FIG. 8.

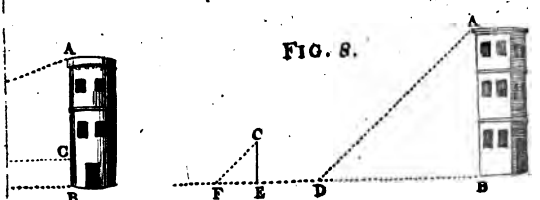
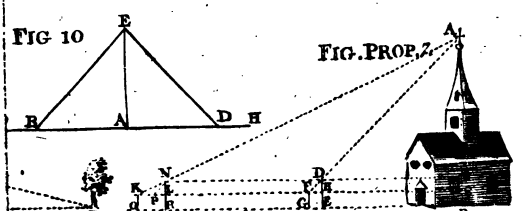


FIG 10

FIG. PROP. 7.



PROP. IX. FIG. 11.

To measure the distance AB, *one of whose extremities is accessible.*

FROM the point, let the right line AC of a known length be made perpendicular to AB, (by the preceeding *Scholium*): likewise draw the right line CD perpendicular to CB, meeting the right line AB in D: then, by the 8. 6. *Eucl.* as DA : AC : : AC : AB. Wherefore when DA and AC are given, AB will be found by the rule of three. Q. E. F.

SCHOLIUM.

All the preceeding operations depend on the equality of some angles of triangles, and on the similarity of the triangles arising from that equality. And on the same principles depend innumerable other operations which a Geometrician will find out of himself, as is very obvious. However some of these operations require such exactness in the work, and without it are so liable to errors, that, *caeteris paribus*, the following operations which are performed by a trigonometrical calculation,

calculation, are to be preferred; yet could we not omit thoſe above, being moſt eaſy in practice, and moſt clear and evident to thoſe who have only the firſt elements of Geometry But if you are provided with inſtruments, the following operations are more to be relied upon. We do not inſiſt on the eaſieſt caſes to thoſe who are ſkilled in plain trigonometry, with is indeed neceſſary to any one who would apply himſelf to practice. It would be eaſy to the reader to find examples; and we have ſhown in plain trigonometry how to find the angle or ſide of any plain triangle that is required, from the angles or ſides that may be given.

PROP. X. FIG. 12.

To deſcribe the conſtruction and uſe of the Geometrical quadrant.

THE Geometrical quadrant is the fourth part of a circle, divided into ninety degrees, to which two ſights are adapted, with a perpendicular or plum-line hanging from the centre. The general uſe of it is for inveſtigating angles in a vertical plane, comprehended

hended under right lines going from the centre of the inſtrument, one of which is horizontal, and the other is directed to ſome viſible point. This inſtrument is made of any ſolid matter, as wood, copper, *&c.*

PROP. XI. FIG. 13.

To deſcribe the make and uſe of the Graphometer.

THE Graphometer is a ſemicircle made of any hard matter, of wood, for example, or braſs, divided into a 180 degrees; ſo fixed on a *fulcrum*, by means of a braſs ball and ſocket, that it eaſily turns about, and retains any ſituation; two ſights are fixed on its diameter. At the centre there is commonly a magnetical needle in a box. There is likewiſe a moveable ruler, which turns round the centre, and retains any ſituation given it. The uſe of it is to obſerve any angle, whoſe vertex is at the centre of the inſtrument in any plane, (though it is moſt commonly horizontal, or nearly ſo), and to find how many degrees it contains.

PROP.

PROP. XII.

FIG. 14. and 15.

To deſcribe the manner in which angles are meaſured by a Quadrant or Graphometer.

LET there be an angle in a vertical plane, comprehended between a line parallel to the horizon HK, and the right line RA, coming from any remarkable point of a tower or hill, or from the ſun, moon, or a ſtar. Suppoſe that this angle RAH is to be meaſured by the Quadrant: let the inſtrument be placed in the vertical plane, ſo as that the centre A may be in the angular point; and let the ſights be directed towards the object at R, (by the help of the ray coming from it, if it be the ſun or moon, or by the help of the viſual ray, if it is any thing elſe), the degrees and minutes in the arch BC cut off by the perpendicular, will meaſure the angle RAH required. For, from the make of the Quadrant, BAD is a right angle; therefore BAR is likewiſe right, being equal to it. But, becauſe HK is horizontal, and AC perpendicular, HAC will be

be a right angle; and therefore equal alſo to BAR. From thoſe angles ſubtract the part HAB that is common to both; and there will remain the angle BAC equal to the angle RAH. But the arch BC is the meaſure of the angle BAC; conſequently, it is likewiſe the meaſure of the angle RAH.

Note, that the remaining arch on the Quadrant DC is the meaſure of the angle RAZ, comprehended between the foreſaid right line RA and AZ which points to the Zenith.

Let it now be required to meaſure the angle ACB (Fig. 15.) in any plane, comprehended between the right lines AC and BC, drawn from two points A and B, to the place of ſtation C. Let the Graphometer be placed at C, ſupported by its *fulcrum* (as was ſhown above); and let the immoveable ſights on the ſide of the inſtrument DE be directed towards the point A; and likewiſe (while the inſtrument remains immoveable) let the ſights of the ruler FG (which is moveable about the centre C) be directed to the point B. It is evident that the moveable ruler cuts off an arch DH, which is the meaſure of the angle ACB ſought. Moreover, by the ſame

method, the inclination of DE, or of FG, may be obſerved with the meridian line, which is pointed out by the magnetick needle incloſed in the box, and is moveable about the centre of the inſtrument, and the meaſure of this inclination or angle found in degrees.

PROP. XIII. FIG. 16.

To meaſure an acceſſible height by the Geometrical quadrant.

BY the 12th *Prop.* of this part, let the angle C be found by means of the Quadrant. Then in the triangle ABC, right-angled at B, (BC being ſuppoſed the horizontal diſtance of the obſervator from the tower), having the angle at C, and the ſide BC, the required height BA will be found by the 3d caſe of plain Trigonometry.

PROP. XIV. FIG. 17.

To meaſure an inacceſſible height by the Geometrical quadrant.

LET the angle ACB be obſerved with the Quadrant (by the 12th *Prop.* of this part); then let the obſerver go from C to the ſecond

ſecond ſtation D, in the right line BCD (providing BCD be a horizontal plane); and after meaſuring this diſtance CD, take the angle ADC likewiſe with the Quadrant. Then, in the triangle ACD, there is given the angle ADC, with the angle ACD; becauſe ACB was given before: therefore (by 32. 1. *Eucl.*) the remaining angle CAD is given likewiſe. But the ſide CD is likewiſe given being the diſtance of the ſtation C and D; therefore (by the firſt caſe of oblique-angled triangles in Trigonometry) the ſide AC will be found. Wherefore in the right-angled triangle ABC, all the angles and the hypothenuſe AC are given; conſequently, by the 4th caſe of Trigonometry, the height ſought AB will be found; as alſo (if you pleaſe) the diſtance of the ſtation C from AB the perpendicular within the hill or inacceſſible height.

PROP. XV. FIG. 18.

From the top of a given height, to meaſure the diſtance BC.

LET the angle BAC be obſerved by the 12th of this part; wherefore in the triangle ABC, right-angled at B, there is given

given by obſervation the angle at A; whence (by the 32. 1. *Eucl.*) there will alſo be given the angle BCA: moreover the ſide AB (being the height of the tower) is ſuppoſed to be given. Wherefore, by the 3d caſe of Trigonometry, BC the diſtance ſought will be found.

PROP. XVI. FIG. 19.

To meaſure the diſtance of two places A *and* B, *of which one is acceſſible, by the Graphometer.*

LET there be erected at two points A and C, ſufficiently diſtant, two viſible ſigns; then (by the 12th of this) let the two angles BAC, BCA be taken by the Graphometer. Let the diſtance of the ſtations A and C be meaſured with a chain. Then the third angle B being known, and the ſide AC being likewiſe known; therfore, by the firſt caſe of Trigonometry, the diſtance required, AB, will be found.

PROP.

PROP. XVII. FIG. 20.

To measure by the Graphometer, the distance of two places, neither of which is accessible.

LET two stations C and D be chosen, from each of which the places may be seen whose distance is sought: let the angles ACD, ACB, BCD, and likewise the angles BDC, BDA, CDA, be measured by the Graphometer; let the distance of the stations C and D be measured by a chain, or (if it be necessary) by the preceeding practice. Now in the triangle ACD, there are given two angles ACD and ADC; therefore the third CAD is likewise given: Moreover the side CD is given; therefore, by the first case of Trigonometry, the side AD will be found. After the same manner, in the triangle BCD, from all the angles and one side CD given, the side BD is found. Wherefore in the triangle ADB, from the given sides DA and DB, and the angle ADB contained by them, the side AB (the distance sought) is found by the 4th case of Trigonometry of oblique-angled triangles.

Let it be noted, that it is not necessary that

that the points A, B, C, and D, be in one plane; and that any triangle is in one plane by 2d *Prop.* 11th of *Eucl.*

PROP. XVIII. FIG. 21.

It is required by the Graphometer and Quadrant, to meaſure an acceſſible height AB, *placed ſo on a ſteep, that one can neither go near it in an horizontal plane, nor recede from it, as we ſuppoſed in the ſolution of the* 14*th* Prop.

LET there be choſen any ſituation as C, and another D; where let ſome mark be erected: let the angles ACD and ADC be found by the Graphometer; then the third angle DAC will be known. Let the ſide CD, the diſtance of the ſtations, be meaſured with a chain, and thence (by Trigon.) the ſide AC will be found. Again, in the triangle ACB, right-angled at B, having found by the Quadrant the angle ACB, the other angle CAB is known likewiſe: but the ſide AC in the triangle ADC is already known; therefore the height required AB will be found by the 4th caſe of right-angled triangles.

angles. If the height of the tower is wanted, the angle BCF will be found by the Quadrant; which being taken from the angle ACB already known, the angle ACF will remain: but the angle FAC was known before; therefore the remaining angle AFC will be known. But the ſide AC was alſo known before; therefore, in the triangle AFC, all the angles and one of the ſides AC being known, AF the height of the tower above the hill will be found by Trigonometry.

SCHOLIUM.

It were eaſy to add many other methods of meaſuring heights and diſtances: but, if what is above be underſtood, it will be eaſy (eſpecially for one that is verſed in the elements) to contrive methods for this purpoſe, according to the occaſion: ſo that there is no need of adding any more of this ſort. We ſhall ſubjoin here a method by which the diameter of the earth may be found out.

PROP.

PROP. XIX. FIG. 22.

To find the diameter of the earth from one obſervation.

LET there be choſen a high hill AB, near the ſea-ſhore, and let the obſervator on the top of it, with an exact Quadrant divided into minutes and ſeconds by tranſverſe diviſions, and fitted with a teleſcope in place of the common ſights, meaſure the angle ABE contained under the right line AB, which goes to the centre, and the right line BE drawn to the ſea, a tangent to the globe at E; let there be drawn from A perpendicular to BD, the line AF meeting BE in F. Now in the right-angled triangle BAF all the angles are given, alſo the ſide AB, the height of the hill; which is to be found by ſome of the foregoing methods, as exactly as poſſible; and, by Trigonometry, the ſides BF and AF are found. But, by Corol. 36. 3d *Eucl.* AF is equal to FE; therefore BE will be known. Moreover, by 36th, 3d *Eucl.* the rectangle under BA and BD, is equal to the ſquare of BE. And thence, by 17th, 6. *Eucl.* as AB : BE :: BE : BD. Therefore,

fore, ſince AB and BE are already given, BD will be found by 11th, 6. *Excl.* or by the rule of three; and ſubtracting BA, there will remain AD the diameter of the earth ſought.

SCHOLIUM.

Many other methods might be propoſed for meaſuring the diameter of the earth. The moſt exact in my opinion is that propoſed by Mr *Picart*, of the academy of ſciences at *Paris*. But ſince it does not belong to this place, we refer you to the philoſophical tranſactions, where you will find it deſcribed.

"According to Mr *Picart*, a degree of "the meridian at the latitude of 49° 21′ was "57060 *French Toiſes*, each of which con- "tains ſix feet of the ſame meaſure; from "which it follows, that if the earth be "an exact ſphere, the circumference of "a great circle of it will be 123,249,600 "*Paris* feet, and the ſemidiameter of the "earth 19,615,800 feet: but the *French* "Mathematicians, who of late have exami- "ned Mr *Picart*'s operations, aſſure us, "That the degree in that latitude is 57,183 "*Toiſes*. They meaſured a degree in *Lap-*

" *land*, in the latitude of 66° 20', and found " it of 57,438 *Toiſes*. By comparing theſe " degrees, as well as by the obſervations " on pendulums, and the theory of gravity, " it appears that the earth is an oblate ſphe- " roid; and (ſuppoſing thoſe degrees to " be accurately meaſured) the axis or dia- " meter that paſſes through the poles will " be to the diameter of the equator, as 177 " to 178, or the earth will be 22 miles " higher at the equator than at the poles. " A degree has likewiſe been meaſured at " the equator, and found to be conſidera- " bly leſs than at the latitude of *Paris*; " which confirms the oblate figure of the " earth. But an account of this laſt men- " ſuration has not been publiſhed as yet. " If the earth was of an uniform denſity " from the ſurface to the centre, then, ac- " cording to the theory of gravity, the me- " ridian would be an exact ellipſis, and the " axis would be to the diameter of the equa- " tor as 230 to 231; and the difference of " the ſemidiameter of the equator and ſemi- " axis about 17 miles."

In what follows, a figure is often to be laid

laid down on paper, like to another figure given; and becauſe this likeneſs conſiſts in the equality of their angles, and in the ſides having the ſame proportion to each other (by the definitions of the 6th of *Eucl.*) we are now to ſhow what methods practical Geometricians uſe for making on paper an angle equal to a given angle, and how they conſtitute the ſides in the ſame proportion. For this purpoſe they make uſe of a Protractor, (or, when it is wanting, a line of chords), and of a line of equal parts.

PROP. XX.

FIG. 23, 24, 25, 26, and 27.

To deſcribe the conſtruction and uſe of the Protractor, of the Line of chords, and of the Line of equal parts.

THE Protractor is a ſmall ſemicircle of braſs, or ſuch ſolid matter. The ſemicircumference is divided into 180 degrees. The uſe of it is, to draw angles on any plane, as on paper, or to examine the extent of angles already laid down. For this laſt purpoſe, let the ſmall point in the centre

of

of the Protractor be placed above the angular point, and let the ſide AB coincide with one of the ſides that contain the angle propoſed; the number of degrees cut off by the other ſide, computing on the Protractor from B, will ſhow the quantity of the angle that is to be meaſured.

But if an angle is to be made of a given quantity on a given line, and at a given point of that line, let AB coincide with the given line, and let the centre A of the inſtrument be applied to that point. Then let there be a mark made at the given number of degrees; and a right line drawn from that mark to the given point, will conſtitute an angle with the given right line, of the quantity required; as is manifeſt.

This is the moſt natural and eaſy method, either for examining the extent of an angle on paper, or for deſcribing on paper an angle of a given quantity.

But when there is ſcarcity of inſtruments, or becauſe a Line of chords is more eaſily carried about, (being deſcribed on a ruler on which there are many other lines beſides) practical Geometricians frequently make

make uſe of it. It is made thus: let the Quadrant of a circle be divided into 90 degrees; (as in Fig. 24.). The right line AB is the chord of 90 deg.; the chord of every arch of the Quadrant is transferred to this line AB, which is always marked with the number of degrees in the correſponding arch.

Note, That the chord of 60 degrees is equal to the radius, by Corol. 15. 4th *Eucl.* If now a given angle EDF is to be meaſured by the Line of chords, from the centre D, with the diſtance DG, (the chord of 60 degrees), deſcribe the arch GF; and let the points G and F be marked where this arch interſects the ſides of the angle. Then if their diſtance GF, applied on the Line of chords from A to B, gives (for example) 25 degrees, this ſhall be the meaſure of the angle propoſed.

When an obtuſe angle is to be meaſured with this line, let its complement to a ſemicircle be meaſured, and thence it will be known. It were eaſy to transfer to the diameter of a circle the chords of all arches to the extent of a ſemicircle; but ſuch are rarely found marked upon rules.

But

But now, if an angle of a given quantity, ſuppoſe of 50 degrees, is to be made at a given point M of the right line KL (Fig. 26.) From the centre M, and the diſtance MN equal to the chord of 60 degrees, deſcribe the arch QN. Take off an arch NR, whoſe chord is equal to that of 50 degrees on the Line of chords; join the points M and R; and it is plain that MR ſhall contain an angle of 50 degrees with the line KL propoſed.

But ſometimes we cannot produce the ſides, till they be of the length of a chord of 60 degrees on our ſcale; in which caſe it is fit to work by a circle of proportions (that is a ſector), by which an arch may be made of a given number of degrees to any radius.

The quantities of angles are likewiſe determined by other lines uſually marked upon rules, as the lines of ſines, tangents, and ſecants; but as theſe methods are not ſo eaſy or ſo proper in this place, we omit them.

To delineate figures ſimilar or like to others given, beſides the equality of the angles, the ſame proportion is to be preſerved among the ſides of the figure that is

to

to be delineated, as is among the ſides of the figure given. For which purpoſe, on the rules uſed by artiſts, there is a line divided into equal parts; more or leſs in number, and greater or leſſer in quantity, according to the pleaſure of the maker.

A foot is divided into inches; and an inch, by means of tranſverſe lines, into 100 equal parts; ſo that with this ſcale, any number of inches, below twelve, with any part of an inch, can be taken by the compaſſes, providing ſuch part be greater than the one hundredth part of an inch. And this exactneſs is very neceſſary in delineating the plans of houſes, and in other caſes.

PROP. XXI. FIG. 28.

To lay down on paper, by the Protractor or Line of chords, and Line of equal parts, a right-lined figure like to one given, providing the angles and ſides of the figure given be known by obſervation or menſuration.

FOR example, ſuppoſe that it is known that in a quadrangular figure, one ſide is of 235 feet, that the angle contained by it and the ſecond ſide is of 84°, the ſecond ſide of

of 288 feet, the angle contained by it and the third ſide of 72°, and that the third ſide is 294 feet. Theſe things being given, a figure is to be drawn on paper like to this quadrangular figure. On your paper, at a proper point A, let a right line be drawn, upon which take 235 equal parts, as AB. The part repreſenting a foot is taken greater or leſſer, according as you would have your figure greater or leſs. In the adjoining figure, the 100th part of an inch is taken for a foot. And accordingly an inch divided into an 100 parts, and annexed to the figure, is called a ſcale of 100 feet. Let there be made at the point B (by the preceeding *Prop.*) an angle ABC of 84°, and let BC be taken of 288 parts like to the former. Then let the angle BCD be made of 72°, and the ſide CD of 294 equal parts. Then let the ſide AD be drawn; and it will compleat the figure like to the figure given. The meaſures of the angle A and D can be known by the Protractor or Line of chords, and the ſide AD by the Line of equal parts; which will exactly anſwer to the correſponding angles and to the ſide of the primary figure.

After

After the very ſame manner, from the ſides and angles given, which bound any right-lined figure, a figure like to it may be drawn, and the reſt of its ſides and angles be known.

COROLLARY.

Hence any trigonometrical problem in right-lined triangles, may be reſolved by delineating the triangle from what is given concerning it, as in this Propoſition. The unknown ſides are examined by a Line of equal parts, and the angles by a Protractor or Line of chords.

PROP. XXII. PROB.

The diameter of a circle being given, to find its circumference nearly.

THE periphery of any polygon inſcribed in the circle is leſs than the circumference, and the periphery of any polygon deſcribed about a circle is greater than the circumference. Whence *Archimedes* firſt diſcovered that the diameter was in proportion to the circumference, as 7 to 22 nearly; which

ſerves for common uſe. But the moderns have computed the proportion of the diameter to the circumference to greater exactneſs. Suppoſing the diameter 100, the periphery will be more than 314, but leſs than 315*. But *Ludolphus van Cuelen* exceeded the labours of all; for by immenſe ſtudy he found, that, ſuppoſing the diameter

100,000,000,000,000,000,000,000,000,000,000,

the periphery will be leſs than

314,159,265,358,979,323,846,264,338,327,951,

but greater than

314,159,265,358,979,323,846,264,338,327,950;

whence it will be eaſy, any part of the circumference being given in degrees and minutes, to aſſign it in parts of the diameter.

Of ſurveying and meaſuring of LAND.

HITHERTO we have treated of the meaſuring of angles and ſides, whence it is abundantly eaſy to lay down a field, a plane, or an entire country: for to this nothing is requiſite but the protraction of triangles, and of other plain figures, after having

* *The diameter is more nearly to the circumference, as* 113 *to* 355.

ving meaſured their ſides and angles. But as this is eſteemed an important part of practical Geometry, we ſhall ſubjoin here an account of it, with all poſſible brevity; ſuggeſting withal, that a Surveyor will improve himſelf more by one day's practice, than by a great deal of reading.

PROP. XXIII. PROB.

To explain what Surveying is, and what inſtruments Surveyors uſe.

FIRST, it is neceſſary that the Surveyor view the field that is to be meaſured, and inveſtigate its ſides and angles, by means of an iron chain (having a particular mark at each foot of length, or at any number of feet, as may be moſt convenient for reducing lines or ſurfaces to the received meaſures*), and the Graphometer deſcribed above. *Secondly*, It is neceſſary to delineate the field *in plano*, or to form a map of it; that is, to lay down on paper a figure ſimilar to the field;

* *See above p. 4. the account of Gunter's chain, and of the chain that is moſt convenient for meaſuring land in Scotland.*

field; which is done by the Protractor (or Line of chords) and of the Line of equal parts. *Thirdly*, It is neceſſary to find out the area of the field ſo ſurveyed and repreſented by a map. Of this laſt we are to treat below, in the ſecond part.

The ſides and angles of ſmall fields are ſurveyed by the help of a Plain-table; which is generally of an oblong rectangular figure, and ſupported by a *fulcrum*, ſo as to turn every way by means of a ball and ſocket. It has a moveable frame, which ſurrounds the board, and ſerves to keep a clean paper put on the board cloſe and tight to it. The ſides of the frame facing the paper are divided into equal parts every way. The board hath beſides a box with a magnetic needle, and moreover a large index with two ſights. On the edge of the frame of the board are marked degrees and minutes, ſo as to ſupply the room of a Graphometer.

PROP.

PROP. XXIV.

PROB. FIG. 29.

To delineate a field by the help of a Plain-table, from one ſtation whence all its angles may be ſeen, and their diſtances meaſured by a chain.

LET the field that is to be laid down be ABCDE. At any convenient place F, let the Plain-table be erected; cover it with clean paper, in which let ſome point near the middle repreſent the ſtation. Then applying at this place the index with the ſights, direct it ſo as that through the ſights ſome mark may be ſeen at one of the angles, ſuppoſe A; and from the point F, repreſenting the ſtation, draw a faint right line along the ſide of the index: then, by the help of the chain, let FA the diſtance of the ſtation from the foreſaid angle be meaſured. Then taking what part you think convenient for a foot or pace from the Line of equal parts, ſet off on the faint line the parts correſponding to the line FA that was meaſured; and let there be a mark made repreſenting the angle of the field A. Keeping

ing the table immoveable, the ſame is to be done with the reſt of the angles; then right lines joining thoſe marks ſhall include a figure like to the field, as is evident from 5. 6. *Eucl.*

COROLLARY.

The ſame thing is done in like manner by the Graphometer; for having obſerved in each of the triangles, AFB, BFC, CFD, *&c.* the angle at the ſtation F, and having meaſured the lines from the ſtation to the angles of the field, let ſimilar triangles be protracted on paper (by the 21. of this) having their common vertex in the point of ſtation. All the lines, excepting thoſe which repreſent the ſides of the field, are to be drawn faint or obſcure.

Note 1. When a Surveyor wants to lay down a field, let him place diſtinctly in a regiſter all the obſervations of the angles, and the meaſures of the ſides, until, at time and place convenient, he draw out the figure on paper.

Note 2. The obſervations made by the help of the Graphometer are to be examined; for all the angles about the point F ought to be equal to four right ones by 13th, 1. *Eucl.*

PROP.

PROP. XXV.

PROB. FIG. 30.

To lay down a field by means of two ſtations, from each of which all the angles can be ſeen, by meaſuring only the diſtance of the ſtations.

LET the inſtrument be placed at the ſtation F; and having choſen a point repreſenting it upon the paper which is laid upon the Plain-table, let the index be applied at this point, ſo as to be moveable about it. Then let it be directed ſucceſſively to the ſeveral angles of the field; and when any angle is ſeen through the ſights, draw an obſcure line along the ſide of the index. Let the index, with the ſights, be directed after the ſame manner to the ſtation G; on the obſcure line drawn along its ſide, pointing to A, ſet off from the Scale of equal parts a line correſponding to the meaſured diſtance of the ſtations; and this will determine the point G. Then remove the inſtrument to the ſtation G; and applying the index to the line repreſenting

ing the diſtance of the ſtations, place the inſtrument ſo that the firſt ſtation may be ſeen through the ſights. Then the inſtrument remaining immoveable, let the index be applied at the point repreſenting the ſecond ſtation G; and be ſucceſſively directed by means of its ſights, to all the angles of the field, drawing (as before) obſcure lines; and the interſection of the two obſcure lines that were drawn to the ſame angle from the two ſtations will always repreſent that angle on the plan. Care muſt be taken that thoſe lines be not miſtaken for one another. Lines joining thoſe interſections will form a figure on the paper like to the field.

SCHOLIUM.

It will not be difficult to do the ſame by the Graphometer, if you keep a diſtinct account of your obſervations of the angles made by the line joining the ſtations and the lines drawn from the ſtations to the reſpective angles of the field. And this is the moſt common manner of laying down whole countries. The tops of two mountains are taken for two ſtations, and their

their diſtance is either meaſured by ſome of the methods mentioned above, or is taken according to common repute. The ſights are ſucceſſively directed towards cities, churches, villages, forts, lakes, turnings of rivers, woods, *&c.*

Note, The diſtance of the ſtations ought to be great enough, with reſpect to the field that is to be meaſured; ſuch ought to be choſen as are not in a line with any angle of the field. And care ought to be taken likewiſe that the angles, for example, FAG, FDG, *&c.* be neither very acute, nor very obtuſe. Such angles are to be avoided as much as poſſible; and this admonition is found very uſeful in practice.

PROP. XXVI.

PROB. FIG. 31.

To lay down any field, however irregular its figure may be, by the help of the Graphometer.

LET ABCEDHG be ſuch a field. Let its angles (in going round it) be obſerved with a Graphometer (by the 12th of

this) and noted down; let its ſides be meaſured with a chain; and (by what was ſaid on the 21ſt of this) let a figure like to the given field be protracted on paper. If any mountain is in the circumference, the horizontal line hid under it is to be taken for a ſide, which may be found by two or three obſervations according to ſome of the methods deſcribed above; and its place on the map is to be diſtinguiſhed by a ſhade, that it may be known a mountain is there.

If not only the circumference of the field is to be laid down in the plan, but alſo its contents, as villages, gardens, churches, public roads, we muſt proceed in this manner.

Let there be (for example) a church F, to be laid down in the plan. Let the angles ABF, BAF be obſerved and protracted on paper in their proper places, the interſection of the two ſides BF and AF will give the place of the church on the paper: or, more exactly, the lines BF, AF being meaſured, let circles be deſcribed from the centers B and A, with parts from the ſcale correſponding to the diſtances BF and AF, and the place of the church will be at their interſection.

Note

Note 1. While the angles obſerved by the Graphometer are taken down, you muſt be careful to diſtinguiſh the external angles, as E and G, that they may be rightly protracted afterwards on paper.

Note 2. Our obſervations of the angles may be examined by computing if all the internal angles make twice as many right angles, four excepted, as there are ſides of the figure; for this is demonſtrated by 32d, 1. *Eucl.* But in place of any external angle DEC, its compliment to a circle is to be taken.

PROP. XXVII.

PROB. FIG. 32.

To lay down a plain field without inſtruments.

IF a ſmall field is to be meaſured, and a map of it to be made, and you are not provided with inſtruments; let it be ſuppoſed to be divided into triangles, by right lines, as in the figure; and after meaſuring the three ſides of any of the triangles, for example of ABC, let its ſides be laid down from a convenient ſcale on paper, by the

the 22d of this. Again, let the other two ſides BD, CD of the triangle CBD be meaſured and protracted on the paper by the ſame ſcale as before. In the ſame manner proceed with the reſt of the triangles of which the field is compoſed, and the map of the field will be perfected; for the three ſides of a triangle determine the triangle; whence each triangle on the paper is ſimilar to its correſpondent triangle in the field, and is ſimilarly ſituated; conſequently the whole figure is like to the whole field.

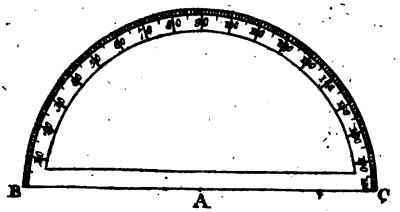
SCHOLIUM.

If the field be ſmall, and all its angles may be ſeen from one ſtation, it may be very well laid down by the Plain-table by the 24th of this. If the field be larger, and have the requiſite conditions, and great exactneſs is not expected, it likewiſe may be plotted by means of the Plain-table, or by the Graphometer, according to the 25th of this; but in fields that are irregular and mountainous, when an exact map is required, we are to make uſe of the Graphometer, as in the 26th of this, but rarely of the Plain-table.

Having

FIG. 22.

FIG. 23.



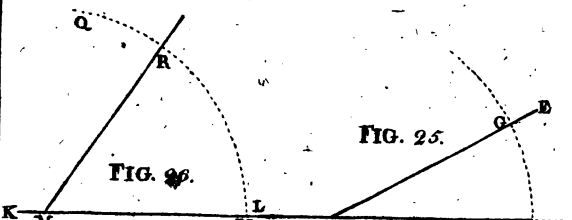
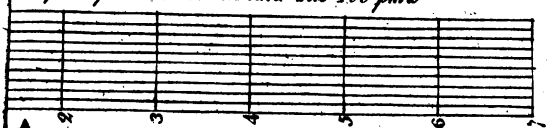


FIG. 26.

FIG. 25.

e of half an Inch divided into 100 parts



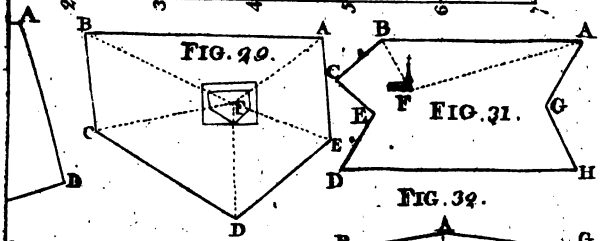
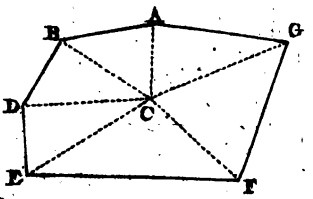


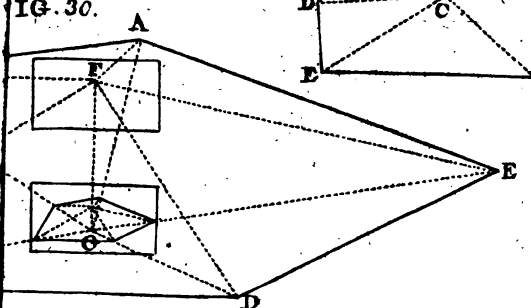
FIG. 29.

FIG. 31.

FIG. 32.



IG. 30.



Having protracted the bounding lines, the particular parts contained within them may be laid down by the proper operations for this purpoſe, delivered in the 26th Propoſition; and the method deſcribed in the 27th Propoſition may be ſometimes of ſervice; for we may truſt more to the meaſuring of ſides, than to the obſerving of angles. We are not to compute four-ſided and many-ſided figures till they are reſolved into triangles; for the ſides do not determine thoſe figures.

In the laying down of cities, or the like, we may make uſe of any of the methods deſcribed above that may be moſt convenient.

The map being finiſhed, it is transferred on clean paper, by putting the firſt ſketch above it, and marking the angles by the point of a ſmall needle. Theſe points being joined by right lines, and the whole illuminated by colours proper to each part, and the figure of the Mariner's compaſs being added to diſtinguiſh the North and South, with a ſcale on the margin, the map or plan will be finiſhed and neat.

We have thus briefly and plainly treated of Surveying, and ſhown by what inſtruments it is performed; having avoided thoſe methods

methods which depend on the magnetick needle, not only becauſe its direction may vary in different places of a field (the contrary of this at leaſt doth not appear), but becauſe the quantity of an angle obſerved by it cannot be exactly known; for an error of two or three degrees can ſcarcely be avoided in taking angles by it. As for the remaining part of Surveying, whereby the area of a field already laid down on paper is found in acres, roods, or any other ſuperficial meaſures; this we leave to the following part, which treats of the menſuration of ſurfaces.

" Beſides the inſtruments deſcribed above, " a Surveyor ought to be provided with an " Off-ſet ſtaff, equal in length to ten links " of the chain, and divided into ten equal " parts. He ought likewiſe to have ten " arrows or ſmall ſtreight ſticks near two " feet long, ſhod with iron ferrils. When " the chain is firſt opened, it ought to be " examined by the Off-ſet ſtaff. In mea- " ſuring any line, the leader of the chain " is to have the ten arrows at firſt ſetting " out. When the chain is ſtretched in the " line, and the near end touches the place

" from

" from which you meaſure, the leader ſticks " one of the ten arrows in the ground, at " the far end of the chain. Then the leader " leaving the arrow, proceeds with the chain " another length; and the chain being " ſtretched in the line, ſo that the near end " touches the firſt arrow, the leader ſticks " down another arrow at his end of the " chain. The line is preſerved ſtreight, if " the arrows be always ſet ſo as to be in " a right line with the place you meaſure " from, and that to which you are going. " In this manner they proceed till the leader " have no more arrows. At the eleventh " chain, the arrows are to be carried to him " again, and he is to ſtick one of them into " the ground, at the end of the chain. And " the ſame is to be done at the 21, 31, 41, " *&c.* chains, if there are ſo many in the " right-line to be meaſured. In this man- " ner you can hardly commit an error in " numbering the chains, unleſs of ten chains " at once.

" The Off-ſet ſtaff ſerves for meaſuring " readily the diſtances of any things pro- " per to be repreſented in your plan, from

" the

" the ſtation-line while you go along. Theſe " diſtances ought to be entered into your " field-book, with the correſponding diſtan- " ces from the laſt ſtation and proper re- " marks, that you may be enabled to plot " them juſtly, and be in no danger of mi- " ſtaking one for another, when you extend " your plan. The field-book may be con- " veniently divided into five pages. In the " middle column the angles at the ſeveral ſta- " tions taken by the Theodolite are to be " entered, with the diſtances from the ſta- " tions. The diſtances taken by the Off-ſet " ſtaff, on either ſide of the ſtation-line, are " to be entered into columns on either ſide " of the middle-column, according to their " poſition with reſpect to that line. The " names or characters of the objects, with " proper remarks, may be entered in columns " on either ſide of theſe laſt.

" Becauſe, in the place of the Grapho- " meter deſcribed by our Author, Survey- " ors now make uſe of the Theodolite, we " ſhall ſubjoin a deſcription of Mr *Siſſon's* " lateſt improved Theodolite from Mr *Gard-*

" *ner's*

" *ner's practical Surveying improved.* See a " figure of it in plate 4.

" In this inſtrument, the three ſtaffs, by " braſs ferrils at top, ſcrew into bell-metal " joints, that are moveable between braſs pil- " lars, fixed in a ſtrong braſs plate; in which " round the centre is fixed a ſocket with a " ball moveable in it, and upon which the " four ſcrews preſs, that ſet the Limb hori- " zontal: next above is another ſuch plate, " through which the ſaid ſcrews paſs, and on " which, round the centre, is fixed a fruſtum " of a cone of bell-metal, whoſe axis (being " connected with the centre of the ball) is al- " ways perpendicular to the Limb, by means " of a conical braſs ferril fitted to it, whereon " is fixed the Compaſs-box; and on it the " Limb, which is a ſtrong bell-metal ring, " whereon are moveable three braſs indexes; " in whoſe plate are fixed four braſs pillars, " that, joining at top, hold the centre-pin of " the bell-metal double Sextant, whoſe double " index is fixed on the centre of the ſame " plate: within the double Sextant is fixed the " ſpirit-level, and over it the Teleſcope.

" The Compaſs-box is graved with two

" diamonds for *North* and *South*; and with " 20 degrees on both ſides of each, that the " needle may be ſet to the variation, and its " error alſo known.

" The Limb has two *Fleur de luces* againſt " the diamonds in the box, inſtead of 180 " each; and is curiouſly divided into whole " degrees, and numbered to the left hand " at every ten to twice 180, having three " indexes diſtant 120, (with *Nonius*'s diviſions " on each for the decimals of a degree), that " are moved by a pinion fixed below one of " them, without moving the Limb; and in " another is a ſcrew and ſpring under, to fix " it to any part of the Limb. It has alſo di- " viſions numbered, for taking the quarter " girt in inches of round *Timber* at the mid- " dle height, when ſtanding ten feet hori- " zontally diſtant from its centre; which at " 20 muſt be doubled, and at 30 trebled; " to which a ſhorter index is uſed, having " *Nonius*'s diviſions for the decimals of an " inch: but an abatement muſt be made for " the bark, if not taken off.

" The double Sextant is divided on one " ſide from under its centre (when the Spirit-

" tube

" tube and Teleſcope are level) to above 60
" degrees each way, and numbered at 10,
" 20, *&c.* and the double index (through
" which it is moveable) ſhews on the ſame
" ſide the degree and decimal of any altitude
" or depreſſion to that extent by *Nonius*'s di-
" viſions: on the other ſide are diviſions
" numbered, for taking the upright height of
" *Timber*, *&c.* in feet, when diſtant 10 feet;
" which at 20 muſt be doubled, and at 30
" tripled; and alſo the quantities for redu-
" cing hypothenuſal lines to horizontal. It
" is moveable by a pinion fixed in the double
" index.

" The Teleſcope is a little ſhorter than
" the diameter of the Limb, that a fall may
" not hurt it; yet it will magnify as much.
" and ſhew a diſtant object as perfect, as
" moſt of treble its length. In its focus are
" very fine croſs wires, whoſe interſection is
" in the plane of the double Sextant; and
" this was a whole circle, and turned in a
" lathe to a true plane, and is fixed at right
" angles to the Limb; ſo that, whenever
" the Limb is ſet horizontal, (which is rea-
" dily done by making the Spirit-tube level

" over

" over two ſcrews, and the like over the o-
" other two), the double Sextant and Tele-
" ſcope are moveable in a vertical plane; and
" then every angle taken on the Limb (tho'
" the Teleſcope be never ſo much elevated
" or depreſſed) will be an angle in the plane
" of the horizon. And this is abſolutely ne-
" ceſſary in plotting a horizontal plane.

" If the lands to be plotted are hilly, and
" not in any one plane, the lines meaſured
" cannot be truly laid down on paper, with-
" out being reduced to one plane, which
" muſt be the horizontal, becauſe angles are
" taken in that plane.——

" In viewing my objects, if they have
" much altitude or depreſſion, I either write
" down the degree and decimal ſhewn on the
" double Sextant, or the links ſhewn on the
" back-ſide; which laſt ſubtracted from e-
" very chain in the ſtation-line, leaves the
" length in the horizontal plane. But if the
" degree is taken, the following table will ſhew
" the quantity.

A TABLE of the links to be ſubtracted out of every chain in hypothenuſal lines *of ſeveral degrees altitude, or depreſſion, for reducing them to* horizontal.

Degrees.	*Links.*	*Degrees.*	*Links.*	*Degrees.*	*Links.*
4,05	¼	14,07	3	23,074	8
5,73	½	16,26	4	24,495	9
7,02	¾	18,195	5	25,84	10
8,11	1	19,95	6	27,13	11
11,48	2	21,565	7	28,36	12

" Let the firſt ſtation-line really meaſure " 1107 links, and the angle of altitude or " depreſſion be 19°,93; looking in the table " I find againſt 19°,95, is 6 links. Now " 6 times 11 is 66; which ſubtracted from " 1107, leaves 1041, the true length to be " laid down in the plan.

" It is uſeful in Surveying, to take the an- " gles which the bounding lines form with " the magnetic needle, in order to check " the angles of the figure, and to plot them " conveniently afterwards."

PART

PART II.

Of the ſurfaces of bodies.

THE ſmalleſt ſuperficial meaſure with us is a ſquare inch; 144 of which make a ſquare foot. Wrights make uſe of theſe in the meaſuring of deals and planks; but the ſquare foot which the Glaziers uſe in meaſuring of glaſs, conſiſts only of 64 ſquare inches. The other meaſures are, *firſt*, the ell ſquare; 2*dly*, the fall, containing 36 ſquare ells; 3*dly*, the rood, containing 40 falls; 4*thly*, the acre, containing 4 roods. Slaters, Maſons, and Pavers, uſe the ell ſquare and the fall; Surveyors of land uſe the ſquare ell, the fall, the rood, and the acre.

The ſuperficial meaſures of the *Engliſh*, are, *firſt*, the ſquare foot; 2*dly*, the ſquare yard, containing 9 ſquare feet; for their yard contains only 3 feet; 3*dly*, the pole, containing $30\frac{1}{4}$ ſquare yards; 4*thly*, the rood, containing 40 poles; 5*thly*, the acre, containing 4 roods. And hence it is eaſy to reduce our ſuperficial meaſures to the *Engliſh*, or theirs to ours.

" In

" In order to find the content of a field, it " is moſt convenient to meaſure the lines by " the chains deſcribed above, *p.* 4. that of " 22 yards for computing the *Engliſh* acres, " and that of 24 *Scots* ells for the acres of " *Scotland.* The chain is divided into 100 " links, and the ſquare of the chain is 10000 " ſquare links; ten ſquares of the chain, or " 100000 ſquare links, give an acre. There- " fore if the area be expreſſed by ſquare links, " divide by 100000, or cut off five decimal " places, and the quotient ſhall give the area " in acres and decimals of an acre. Write " the entire acres apart; but multiply the de- " cimals of an acre by 4, and the product " ſhall give the remainder of the area in roods " and decimals of a rood. Let the entire " roods be noted apart after the acres; then " multiply the decimals of a rood by 40, and " the product ſhall give the remainder of the " area in falls or poles. Let the entire falls or " poles be then writ after the roods, and mul- " tiply the decimals of a fall by 36, if the area " is required in the meaſures of *Scotland*; but " multiply the decimals of a pole by $30\frac{1}{4}$, if " the area is required in the meaſures of *Eng-*

" *land,*

" *land*, and the product ſhall give the remain-
" der of the area in ſquare ells in the former
" caſe, but in ſquare yards in the latter. If,
" in the former caſe, you would reduce the
" decimals of the ſquare ell to ſquare feet,
" multiply them by 9.50694; but in the lat-
" ter caſe, the decimals of the *Engliſh* ſquare
" yard are reduced to ſquare feet, by mul-
" tiplying them by 9.

" Suppoſe, for example, that the area ap-
" pears to contain 1265842 ſquare links of
" the chain of 24 ells; and that this area is
" to be expreſſed in acres, roods, falls, *&c.*
" of the meaſures of *Scotland*. Divide the
" ſquare-links by 100000, and the quotient
" 12.65842 ſhows the area to contain 12
" acres $\frac{65842}{100000}$ of an acre. Multiply the
" decimal part by 4, and the product 2.63368
" gives the remainder in roods and decimals
" of a rood. Thoſe decimals of the rood
" being multiplied by 40, the product gives
" 25.3472 falls. Multiply the decimals of
" the fall by 36, and the product gives
" 12.4992 ſquare ells. The decimals of the
" ſquare ell multiplied by 9.50994 give
" 4.7458

" 4.7458 ſquare feet. Therefore the area " propoſed amounts to 12 acres, 2 roods, 25 " falls, 12 ſquare ells, and $4\frac{7458}{10000}$ ſquare feet.

" But if the area contains the ſame number " of ſquare links of *Gunter*'s chain, and is to " be expreſſed by *Engliſh* meaſures, the " acres and roods are computed in the ſame " manner as in the former caſe. The poles " are computed as the falls. But the deci- " mals of the pole, *viz.* $\frac{3472}{10000}$ are to be " multiplied by $30\frac{1}{4}$ (or 30.25), and the pro- " duct gives 10.5028 ſquare yards. The " decimals of the ſquare yard multiplied by " 9, give 4.5252 ſquare feet; therefore in " this caſe the area is in *Engliſh* meaſure 12 " acres, 2 roods, 25 poles, 10 ſquare yards, " and $4\frac{5252}{10000}$ ſquare feet.

" The *Scots* acre is to the *Engliſh* acre, by " ſtatute, as 100000 to 78694, if we have re- " gard to the difference betwixt the *Scots* and " *Engliſh* foot above mentioned. But it is cu- " ſtomary in ſome parts of *England* to have " 18, 21, *&c.* feet to a pole, and 160 ſuch " poles to an acre: whereas, by the ſtatute, " $16\frac{1}{2}$ feet make a pole. In ſuch caſes the

" acre is greater in the duplicate ratio of the " number of feet to a pole.

" They who meaſure land in *Scotland* by " an ell of 37 *Engliſh* inches, make the acre " leſs than the true *Scots* acre by $593\frac{6}{10}$ ſquare " *Engliſh* feet, or by about $\frac{1}{9\,1}$ of the acre.

" An huſband-land contains 6 acres of " ſock and ſythe land, that is of land that " may be tilled with a plough, and mown " with a ſythe; 13 acres of arable land make " an oxgang or oxengate; four oxengate " make a pound land of old extent (by a de- " cree of the Exchequer, *March* 11. 1585), " and is called *librata terræ*. A forty ſhilling " land of old extent contains eight oxgang, " or 104 acres.

" The *arpent* about *Paris* contains 32400 " ſquare *Paris* feet, and is equal to $2\frac{2}{3}$ *Scots* " roods or $3\frac{37}{100}$ *Engliſh* roods.

" The *actus quadratus*, according to *Varro* " *Collumella*, *&c.* was a ſquare of 120 *Roman* " feet. The *Jugerum* was the double of this. " 'Tis to the *Scots* acre as 10000 to 20456, " and to the *Engliſh* acre as 10000 to 16097. " It was divided (like the *As*) into 12 *uncias*, " and the *uncia* into 24 *ſcrupula*." This, with the

the three preceeding paragraphs, are taken from an ingenious manuſcript written by Sir *Robert Stewart* Profeſſor of natural philoſophy. The greateſt part of the table in *p.* 5. was taken from it likewiſe.

PROP. I.

PROB. FIG. 1.

To find out the area of a rectangular parallelogram ABCD.

LET the ſide AB, for example, be five feet long, and BC (which conſtitutes with BA a right angle at B) be 17 feet. Let 17 be multiplied by 5, and the product 85 will be the number of ſquare feet in the area of the figure ABCD. But if the parallelogram propoſed is not rectangular as BEFC, its baſe BC multiplied into its perpendicular height AB (not into its ſide BE) will give its area. This is evident from 35th 1. *Eucl.*

PROP. II.

PROB. FIG. 2.

To find the area of a given triangle.

LET the triangle BAC be given, whole baſe BC is ſuppoſed 9 feet long; let the perpen-

perpendicular AD be drawn from the angle A oppoſite to the baſe, and let us ſuppoſe AD to be 4 feet. Let the half of the perpendicular be multiplied into the baſe, or the half of the baſe into the perpendicular, or take the half of the product of the whole baſe into the perpendicular, the product gives 18 ſquare feet for the area of the given triangle.

But if only the ſides are given, the perpendicular is found either by protracting the triangle, or by 12th and 13th 2. *Eucl.* or by Trigonometry. But how the area of a triangle may be found from the given ſides only, ſhall be ſhown in the 4th Prop. of this part.

PROP. III.

PROB. FIG. 3.

To find the area of any rectilineal figure.

IF the figure be irregular, let it be reſolved into triangles; and drawing perpendiculars to the baſes in each of them, let the area of each triangle be found by the preceeding Prop, and the ſum of theſe areas will give the area of the figure.

SCHO-

SCHOLIUM 1.

In meaſuring boards, planks, and glaſs, their ſides are to be meaſured by a foot-rule divided into 100 equal parts; and after multiplying the ſides, the decimal fractions are eaſily reduced to leſſer denominations. The menſuration of theſe is eaſy, when they are rectangular parallelograms.

SCHOLIUM 2.

If a field is to be meaſured, let it firſt be plotted on paper, by ſome of the methods deſcribed in the preceeding part, and let the figure ſo laid down be divided into triangles, as was ſhown in the preceeding Propoſition.

The baſe of any triangle, or the perpendicular upon the baſe, or the diſtance of any two points of the field is meaſured, by applying it to the ſcale according to which the map is drawn.

SCHOLIUM 3.

But if the field given be not in a horizontal plane, but uneven and mountainous, the ſcale gives the horizontal line between any two points, but not their diſtance meaſured on the uneven

uneven ſurface of the field. And indeed it would appear that the horizontal plane is to be accounted the area of an uneven and hilly country. For if ſuch ground is laid out for building on, or for planting with trees or bearing corn, ſince theſe ſtand perpendicular to the horizon, it is plain that a mountainous country cannot be conſidered as of greater extent for thoſe uſes than the horizontal plane; nay, perhaps, for nouriſhing of plants, the horizontal plane may be preferable.

If however the area of a figure as it lies irregularly on the ſurface of the earth is to be meaſured, this may be eaſily done by reſolving it into triangles as it lies. The ſum of their areas will be the area ſought; which exceeds the area of the horizontal figure more or leſs, according as the field is more or leſs uneven.

PROP. IV.

PROB. FIG. 2.

The ſides of a triangle being given, to find the area, without finding the perpendicular.

LET all the ſides of the triangle be collected into one ſum; from the half of which let the

the ſides be ſeparately ſubtracted, that three differences may be found betwixt the foreſaid half ſum and each ſide; then let theſe three differences, and the half ſum be multiplied into one another, and the ſquare-root of the product will give the area of the triangle. For example, let the ſides be 10, 17, 21; the half of their ſum is 24; the three differences betwixt this half ſum and the three ſides, are 14, 7, and 3. The firſt being multiplied by the ſecond, and their product by the third, we have 294 for the product of the differences; which multiplied by the foreſaid half ſum 24, gives 7056; the ſquare-root of which 84 is the area of the triangle. The demonſtration of this, for the ſake of brevity, we omit. It is to be found in ſeveral treatiſes, particularly in *Clavius*'s *Practical Geometry*.

PROP. V.

THEOR. FIG. 4.

The area of the ordinate figure ABEFGH *is equal to the product of the half-circumference of the polygon multiplied into the perpendicular drawn*

drawn from the centre of the circumscribed circle to the side of the polygon.

FOR the ordinate figure can be resolved into as many equal triangles, as there are sides of the figure; and since each triangle is equal to the product of half the base into the perpendicular, it is evident that the sum of all the triangles together, that is the polygon, is equal to the product of half the sum of the bases (that is the half of the circumference of the polygon) into the common perpendicular height of the triangles drawn from the centre C to one of the sides; for example to AB.

PROP. VI.

PROB. FIG. 5.

The area of a circle is found by multiplying the half of the periphery into the radius, or the half of the radius into the periphery.

FOR a circle is not different from an ordinate or regular polygon of an infinite number of sides, and the common height of the triangles into which the polygon, or circle may

may be ſuppoſed to be divided, is the radius of the circle.

Were it worth while, it were eaſy to demonſtrate accurately this Propoſition by means of the inſcribed and circumſcribed figures, as is done in the 5th Prop. of the treatiſe of *Archimedes* concerning the dimenſions of the circle.

COROLLARY.

Hence alſo it appears that the area of the ſector ABCD is produced, by multiplying the half of the arch into the radius; and likewiſe that the area of the ſegment of the circle ADC is found, by ſubtracting from the area of the ſector the area of the triangle ABC.

PROP. VII.

THEOR. FIG. 6.

The circle is to the ſquare of the diameter, as 11 *to* 14 *nearly.*

FOR if the diameter AB be ſuppoſed to be 7, the circumference AHBK will be almoſt 22 (by the 22d Prop. of the firſt part of

this), and the area of the ſquare DC will be 49; and, by the preceeding Prop. of this, the area of the circle will be $38\frac{1}{2}$: therefore the ſquare DC will be to the inſcribed circle as 49 to $38\frac{1}{2}$, or as 98 to 77, that is, as 14 to 11. *Q. E. D.*

If greater exactneſs is required, you may proceed to any degree of accuracy: for the ſquare DC is to the inſcribed circle, as 1 to $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \frac{1}{13}$ &c. *in infinitum.*

" This ſeries will be of no ſervice for com-
" puting the area of the circle accurately,
" without ſome further artifice, becauſe it
" converges at too ſlow a rate. The area of
" the circle will be found exactly enough for
" moſt purpoſes, by multiplying the ſquare
" of the diameter by 7854, and dividing by
" 10000, or cutting off four decimal places
" from the product; for the area of the cir-
" cle is to the circumſcribed ſquare nearly as
" 7854 to 10000."

PROP.

PROP. VIII.

PROB. FIG. 7.

To find the area of a given ellipſe.

LET ABCD be an ellipſe, whoſe greater diameter is BD and leſſer AC, biſecting the greater perpendiculary in E. Let a mean proportional HF be found (by 13th 6. *Eucl.*) between AC and BD, and (by the 6th of this) find the area of the circle deſcribed on the diameter HF. I ſay, that this area is equa to the area of the ellipſe ABCD. For becauſe, as BD to AC, ſo the ſquare of BD to the ſquare of HF, (by 2 *Cor.* 20th 6. *Eucl.*) : but (by the 2d 12. *Eucl.*) as the ſquare of BD to the ſquare of HF, ſo is the circle of the diameter BD to the circle of the diameter HF : therefore as BD to AC, ſo is the circle of the diameter BD to the circle of the diameter HF. And (by the 5th Prop. of *Archimedes* of ſpheroids) as the greater diameter BD to the leſſer AC, ſo is the circle of the diameter BD to the ellipſe ABCD. Conſequently (by the 11th 5. *Eucl.*) the circle of the diameter BD will have the ſame proportion to the circle of the diame-

ter

ter HF, and to the ellipſe ABCD. Therefore, by 9th 5. *Eucl.* the area of the circle of the diameter HF will be equal to the area of the ellipſe ABCD. *Q. E. D.*

SCHOLIUM.

From this and the two preceeding Propoſitions, a method is derived of finding the area of an ellipſe. There are two ways: 1ſt, Say as one is to the leſſer diameter, ſo is the greater diameter to a 4th number, (which is found by the rule of three.) Then again ſay, as 14 to 11, ſo is the 4th number found to the area ſought. But the ſecond way is ſhorter. Multiply the leſſer diameter into the greater, and the product by 11; then divide the whole product by 14, and the quotient will be the area ſought of the ellipſe. For example, let the greater diameter be 10, and the leſſer 7, by multiplying 10 by 7, the product is 70; and multiplying that by 11, it is 770; and dividing 770 by 14, the quotient will be 55, which is the area of the ellipſe ſought.

"The area of the ellipſe will be found

"more

" more accurately, by multiplying the pro-
" duct of the two diameters by 7854."

We ſhall add no more about other plain ſurfaces, whether rectilinear or curvilinear, which ſeldom occur in practice; but ſhall ſubjoin ſome propoſitions about meaſuring the ſurfaces of ſolids.

PROP. IX. PROB.

To meaſure the ſurface of any priſm.

BY the 14th definition of the 11th *Eucl.* a priſm is contained by planes, of which two oppoſite ſides (commonly called the baſes) are plain rectilineal figures; which are either regular and ordinate, and meaſured by Prop. 5. of this part; or, however irregular, and then they are meaſured by the 3d Prop. of this book. The other ſides are parallelograms, which are meaſured by the 1ſt Prop. of this ſecond part; and the whole ſuperficies of the priſm conſiſts of the ſum of thoſe taken altogether.

PROP.

PROP. X. PROB.

To meaſure the ſuperficies of any pyramid.

SINCE its baſis is a rectilineal figure, and the reſt of the planes terminating in the top of the pyramid are triangles, theſe meaſured ſeparately, and added together, give the ſurface of the pyramid required.

PROP. XI. PROB.

To meaſure the ſuperficies of any regular body.

THESE bodies are called regular, which are bounded by equilateral and equiangular figures. The ſuperficies of the tetraedron conſiſts of four equal and equiangular triangles; the ſuperficies of the hexaedron, or cube, of ſix equal ſquares; an octaedron, of eight equal equilateral triangles; a dodecaedron, of twelve equal and ordinate pentagons; and the ſuperficies of an icoſiaedron, of twenty equal and equilateral triangles. Therefore it will be eaſy to meaſure theſe ſurfaces from what has been already ſhown.

In the ſame manner we may meaſure the ſuperficies of a ſolid contained by any planes.

PROP.

PROP. XII.

PROB. FIG. 8.

To measure the superficies of a cylinder.

BECAUSE a cylinder differs very little from a prism whose opposite planes (or bases) are ordinate figures of an infinite number of sides, it appears that the superficies of a cylinder, without the bases, is equal to an infinite number of parallelograms; the common altitude of all which is, with the height of the cylinder, and the bases of them all differ very little from the periphery of the circle which is the base of the cylinder. Therefore this periphery multiplied into the common height, gives the superficies of the cylinder, excluding the bases; which are to be measured separately by the help of the 6th Prop. of this part.

This Proposition concerning the measure of the surface of the cylinder (excluding its basis) is evident from this, That when it is conceived to be spread out, it becomes a parallelogram, whose base is the periphery of the circle of the base of the cylinder stretched into a right

right line, and whoſe height is the ſame with the height of the cylinder.

PROP. XIII.

PROB. FIG. 9.

To meaſure the ſurface of a right cone.

THE ſurface of a right cone is very little different from the ſurface of a right pyramid, having an ordinate polygon for its baſe of an infinite number of ſides; the ſurface of which (excluding the baſe) is equal to the ſum of the triangles. The ſum of the baſes of theſe triangles is equal to the periphery of the circle of the baſe, and the common height of the triangles is the ſide of the cone AB: wherefore the ſum of theſe triangles is equal to the product of the ſum of the baſes (*i. e.* the periphery of the baſe of the cone) multiplied into the half of the common height, or it is equal to the product of the periphery of the baſe.

If the area of the baſe is likewiſe wanted, it is to be found ſeparately by the 6th Prop. of this part. If the ſurface of a cone is ſuppoſed

poſed to be ſpread out on a plane, it will become a ſector of a circle, whoſe radius is the ſide of the cone; and the arch terminating the ſector is made from the periphery of the baſe. Whence, by Corol. 6. Prop. of this, its dimenſion may be found.

COROLLARY.

Hence it will be eaſy to meaſure the ſurface of a *fruſtum* of a cone cut by a plane parallel to the baſe. As to what relates to the meaſuring of the ſurface of the ſcalenous cone, becauſe it is not very uſeful in practice, we ſhall not deſcribe the method; which would carry us beyond the limits of this treatiſe.

PROP. XIV.

PROB. FIG. 10.

To meaſure the ſurface of a given ſphere.

LET there be a ſphere, whoſe center is A, and let the area of its convex ſurface be required. *Archimedes* demonſtrates (37. Prop. 1. book of the ſphere and cylinder) that its ſurface is equal to the area of four great cir-

cles of the ſphere; that is, let the area of the great circle be multiplied by 4, and the product will give the area of the ſphere; or, by 20th 6, and 2d 12. of *Eucl.* the area of the ſphere given is equal to the area of a circle whoſe radius is the right line BC, the diameter of the ſphere. Therefore having meaſured (by 6th Prop. of this part) the circle deſcribed with the radius BC, this will give the ſurface of the ſphere.

PROP. XV.

PROB. FIG. 10.

To meaſure the ſurface of a ſegment of a ſphere.

LET there be a ſegment cut off by the plane ED. *Archimedes* demonſtrates (49. and 50. 1. *de ſphaera*) that the ſurface of this ſegment, excluding the circular baſe, is equal to the area of a circle whoſe radius is the right line BE drawn from the vertex B of the ſegment to the periphery of the circle DE. Therefore, by the 6th Prop. of this part, it is eaſily meaſured.

COROL-

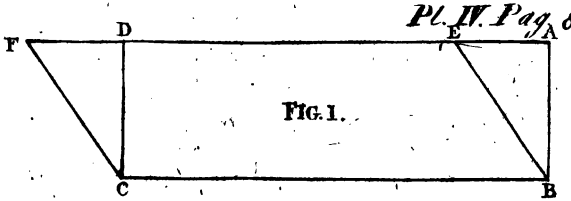


FIG. 1.

FIG. 2.

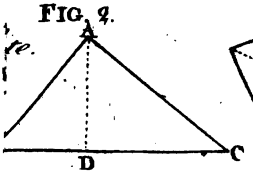


FIG. 3.

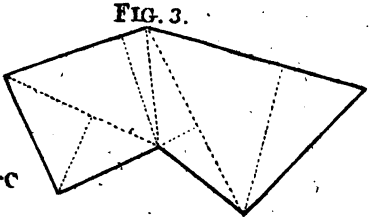


FIG. 4.

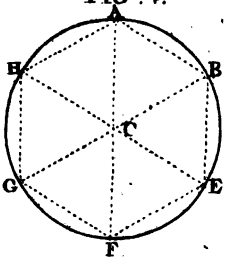
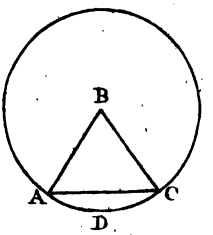


FIG. 5.



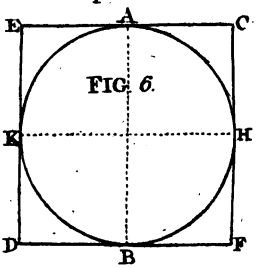


FIG. 6.

FIG. 7.

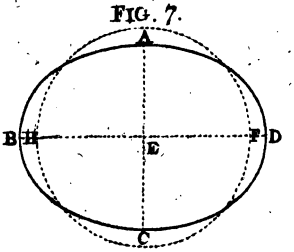


FIG. 10.

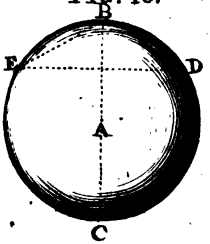
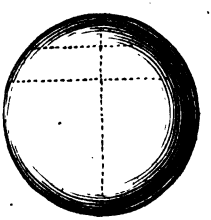


FIG. 9.

FIG. 11.



COROLLARY 1.

Hence that part of the ſurface of a ſphere that lieth between two parallel planes is eaſily meaſured, by ſubtracting the ſurface of the leſſer ſegment from the ſurface of the greater ſegment.

COROLLARY 2.

Hence likewiſe it follows, that the ſurface of a cylinder deſcribed about a ſphere (excluding the baſis) is equal to the ſurface of the ſphere, and the parts of the one to the parts of the other, intercepted between planes parallel to the baſis of the cylinder.

PART III.

Of ſolid figures and their menſuration.

AS in the preceeding parts we took an inch for the ſmalleſt meaſure in length, and an inch ſquare for the ſmalleſt ſuperficial meaſure; ſo now, in treating of the menſuration of ſolids, we take a cubical inch for the ſmalleſt ſolid meaſure. Of theſe 109 make a *Scots* pint; other liquid meaſures depend on this, as is generally known.

In

In dry meaſures, the firlot, by ſtatute, contains $19\frac{1}{2}$ pints; and on this depend the other dry meaſures: therefore, if the content of any ſolid be given in cubical inches, it will be eaſy to reduce the ſame to the common liquid or dry meaſures, and converſely to reduce theſe to ſolid inches. The liquid and dry meaſures in uſe among other nations, are known from their writers.

" As to the *Engliſh* liquid meaſures, by " act of Parliament 1706, any round veſſel, " commonly called a cylinder, having an " even bottom, being ſeven inches in diame- " ter throughout, and ſix inches deep from " the top of the inſide to the bottom, (which " veſſel will be found by computation to con- " tain $230\frac{907}{1000}$ cubical inches); or any veſſel " containing 231 cubical inches, and no more, " is deemed to be a lawful wine gallon. " An *Engliſh* pint therefore contains $28\frac{7}{8}$ cu- " bical inches; two pints make a quart; four " quarts a gallon; 18 gallons a roundlet; " three roundlets and an half, or 63 gallons, " make a hogſhead; the half of a hogſhead " is a barrel; one hogſhead and a third, or " 84 gallons, make a puncheon; one pun-

" cheon

" cheon and a half, or two hogſheads, or " 126 gallons, make a pipe or butt; the " third part of a pipe, or 42 gallons, make a " tierce; two pipes, or three puncheons, or " four hogſheads, make a tun of wine. " Though the *Engliſh* wine-gallon is now fix- " ed at 231 cubical inches, the ſtandard kept " in *Guildhall* being meaſured, before many " perſons of diſtinction, *May* 25. 1688, it was " found to contain only 224 ſuch inches.

" In the *Engliſh* beer-meaſure, a gallon " contains 282 cubical inches; conſequently " $35\frac{1}{4}$ cubical inches make a pint, two pints " make a quart, four quarts make a gallon, " nine gallons a firkin, four firkins a barrel. " In ale, eight gallons make a firkin, and 32 " gallons make a barrel. By an act of the " firſt of *William* and *Mary*, 34 gallons is " the barrel, both for beer and ale, in all " places, except within the weekly bills of " mortality.

" In *Scotland*, it is known that four gills " make a mutchkin, two mutchkins make a " chopin, a pint is two chopins, a quart is " two pints, and a gallon is four quarts or " eight pints. The accounts of the cubical

" inches

" inches contained in the *Scots* pint vary " conſiderably from each other. Accord- " ing to our Author, it contains 109 cu- " bical inches. But the ſtandard-jugs kept " by the Dean of Guild of *Edinburgh* (one " of which has the year 1555, with the " arms of *Scotland*, and of the town of *Edin-* " *burgh* marked upon it) having been care- " fully meaſured ſeveral times, and by dif- " ferent perſons, the *Scots* pint, according " to thoſe ſtandards, was found to contain " about $103\frac{4}{10}$ cubic inches. The Pew- " terers jugs (by which the veſſels in com- " mon uſe are made) are ſaid to contain " ſometimes betwixt 105 and 106 cubic " inches. A caſk that was meaſured by the " Brewers of *Edinburgh*, before the Com- " miſſioners of Exciſe in 1707, was found " to contain $46\frac{7}{8}$ *Scots* pints; the ſame veſſel " contained $18\frac{1}{16}$ *Engliſh* ale-gallons. Sup- " poſing this menſurating to be juſt, the " *Scots* pint will be to the *Engliſh* ale-gallon " as 289 to 750; and if the *Engliſh* ale- " gallon be ſuppoſed to contain 282 cubi- " cal inches, the *Scots* pint will contain " 108.664 cubical inches. But it is ſuſpected,

" on

" on ſeveral grounds, that this experiment was " not made with ſufficient care and exactneſs.

" The Commiſſioners appointed by autho- " rity of Parliament to ſettle the meaſures " and weights, in their act of *February* 19. " 1618, relate, That having cauſed fill the " *Linlithgow* firlot with water, they found " that it contained $21\frac{1}{4}$ pints of the juſt " *Stirling* jug and meaſure. They likewiſe " ordain that this ſhall be the juſt and only " firlot, and add, *That the wideneſs and bread-* " *neſs of the which firlot, under and above,* " *even over within the buirds, ſhall contain* " *nineteen inches and the ſixth part of an inch,* " *and the deepneſs ſeven inches and a third* " *part of an inch.* According to this act " (ſuppoſing their experiment and computa- " tion to have been accurate) the pint con- " tained only 99.56 cubical inches; for the " content of ſuch a veſſel as is deſcribed in " the act is 2115.85, and this divided by " $21\frac{1}{4}$, gives 99.56. But, by the weight " of water ſaid to fill this firlot in the ſame " act, the meaſure of the pint agrees nearly " with the *Edinburgh* ſtandard above men- " tioned.

" As

" As for the *Engliſh* meaſures of corn, the " *Wincheſter* gallon contains 272¼ cubical inch- " es, two gallons make a peck, four pecks, or " eight gallons (that is 2178 cubical inches " make a buſhel, and a quarter is eight buſhels.

" Our author ſays, that 19½ *Scots* pints " make a firlot. But this does not appear " to be agreeable to the ſtatute above men- " tioned, nor to the ſtandard-jugs. It may " be conjectured that the proportion aſſigned " by him has been deduced from ſome expe- " riment of how many pints, according to " common uſe, were contained in the fir- " lot. For if we ſuppposе thoſe pints to have " been each of 108.664 cubical inches, ac- " cording to the experiment made in the " 1707, before the Commiſſioners of Ex- " ciſe deſcribed above; then 19½ ſuch pints " will amount to 2118.94 cubical inches, " which agrees nearly with 2115.85, the " meaſure of the firlot by the ſtatute above " mentioned. But it is probable, that in " this he followed the act 1587, where it is " ordained, That the wheat firlot ſhall con- " tain 19 pints and two joucattes. A wheat " firlot marked with the *Linlithgow* ſtamps

" being

" being measured, was found to contain a-
" bout 2211 cubical inches. By the statute
" of 1618, the barley-firlot was to contain
" 31 pints of the just *Stirling* jug.

A *Paris* pint is 48 cubical *Paris* inches,
" and is nearly equal to an *English* wine
" quart. The *Boissean* contains 644.68099
" *Paris* cubical inches, or 780.36 *English*
" cubical inches.

The *Roman Amphora* was a cubical *Ro-*
" *man* foot, the *Congius* was the 8th part
" of the *Amphora*, the *Sextarius* was one
" sixth of the *Congius*. They divided the
" *Sextarius* like the *As* or *Libra*. Of dry
" measures, the *Medimnus* was equal to two
" *Amphoræ*, that is about $1\frac{1}{2}\frac{1}{5}$ *English* legal
" bushels; and the *Medius* was the third
" part of the *Amphora*."

PROP. I. PROB.

To find the solid content of a given prism.

BY the 2d Prop. of the 2d part of this, let the area of the base of the prism be measured, and be multiplied by the height

of the priſm, the product will give the ſolid content of the priſm.

PROP. II. PROB.

To find the ſolid content of a given pyramid.

THE area of the baſe being found (by the 3d Prop. of the 2d part) let it be multiplied by the third part of the height of the pyramid, or the third part of the baſe by the height, the product will give the ſolid content, by 7th 12. *Eucl.*

COROLLARY.

If the ſolid content of a *fruſtum* of a pyramid is required, firſt let the ſolid content of the intire pyramid be found; from which ſubtract the ſolid content of the part that is wanting, and the ſolid content of the broken pyramid will remain.

PROP. III. PROB.

To find the content of a given cylinder.

THE area of the baſe being found (by Prop. 6. of the 2d part) if it be a circle, and

and by Prop. 8. if it be an ellipſe (for in both caſes it is a cylinder) multiply it by the height of the cylinder, and the ſolid content of the cylinder will be produced.

COROLLARY. FIG. I.

And in this manner may be meaſured the ſolid content of veſſels and caſks not much different from a cylinder as ABCD. If towards the middle EF it be ſomewhat groſſer, the area of the circle of the baſe being found (by 6th Prop. of the 2d part) and added to the area of the middle circle EF, and the half of their ſum (that is an arithmetical mean between the area of the baſe, and the area of the middle circle) taken for the baſe of the veſſel, and multiplied into its height, the ſolid content of the given veſſel will be produced.

Note, That the length of the veſſel, as well as the diameters of the baſe, and of the circle EF, ought to be taken within the ſtaves; for it is the ſolid content within the ſtaves that is ſought.

PROP.

PROP. IV. PROB.

To find the ſolid content of a given cone.

LET the area of the baſe (found by Prop. 6. 2d part) be multiplied into $\frac{1}{3}$ of the height, the product will give the ſolid content of the cone; for (by 10th 12. *Eucl.*) a cone is the third part of a cylinder that has the ſame baſe and height.

PROP. V.

PROB. FIG. 2. and 3.

To find the ſolid content of a fruſtum *of a cone cut by a plane parallel to the plane of the baſe.*

FIRST let the height of the intire cone be found, and thence (by the preceeding Prop.) its ſolid content; from which ſubtract the ſolid content of the cone cut off at the top, there will remain the ſolid content of the *fruſtum* of the cone.

How the content of the intire cone may be found, appears thus: let ABCD be the *fruſtum* of the cone (either right or ſcalenous,

nous, as in the figures 2. and 3.); let the cone ECD be ſuppoſed to be compleated; let AG be drawn parallel to DE, and let AH and EF be perpendicular on CD; it will be (by 2d 6. *Eucl.*) as CG: CA:: CD: CE; but (by the 4th Prop. of the ſame book) as CA : AH : : CE : EF; conſequently (by 22d 5. *Eucl.*) as CG : AH : : CD : EF; that is, as the exceſs of the diameter of the leſſer baſe, is to the height of the *fruſtum*, ſo is the diameter of the greater baſe to the height of the intire cone.

COROLLARY. Fig. 4.

Some caſks whoſe ſtaves are remarkably bended about the middle, and ſtreight towards the ends, may be taken for two portions of cones, without any conſiderable error. Thus ABEF is a *fruſtum* of a right cone, to whoſe baſe EF, on the other ſide, there is another ſimilar *fruſtum* of a cone joined EDCF. The vertices of theſe cones, if they be ſuppoſed to be compleated, will be found at G and H. Whence, by the preceeding Prop. the ſolid content of ſuch veſſels may be found.

PROP.

PROP. VI.

THEOR. FIG. 5.

A Cylinder circumſcribed about a ſphere, that is, having its baſe equal to a great circle of the ſphere, and its height equal to the diameter of the ſphere, is to the ſphere as 3 to 2.

Let ABEC be the quadrant of a circle, and ABDC the circumſcribed ſquare; and likewiſe the triangle ADC; by the revolution of the figure about the right line AC as axis, a hemiſphere will be generated by the quadrant, a cylinder of the ſame baſe and height by the ſquare, and a cone by the triangle. Let theſe three be cut any how by the plane HF parallel to the baſe AB, the ſection in the cylinder will be a circle, whoſe radius is FH; in the hemiſphere, a circle of the radius EF; and in the cone, a circle of the radius GF.

By the 47th 1. *Eucl.* EAq, or HFq=EFq and FAq taken together, (but AFq=FGq, becauſe AC=CD); therefore the circle of the radius HF, is equal to a circle of the radius EF together with a circle of the radius

radius GF; and ſince this is true every where, all the circles together deſcribed by the reſpective *radii* HF (that is the cylinder) are equal to all the circles deſcribed by the reſpective *radii* EF and FG (that is to the hemiſphere and the cone taken together); but, by 10th 12. *Eucl.* the cone generated by the triangle DAC is one third part of the cylinder generated by the ſquare BC. Whence it follows, that the hemiſphere generated by the rotation of the quadrant ABEC, is equal to the remaining two third parts of the cylinder, and that the whole ſphere is $\frac{2}{3}$ of the double cylinder circumſcribed about it.

This is that celebrated 39th Prop. 1. book of *Archimedes* of the ſphere and cylinder; in which he determines the proportion of the cylinder to the ſphere inſcribed to be that of 3 to 2.

COROLLARY.

Hence it follows, that the ſphere is equal to a cone, whoſe height is equal to the ſemidiameter of the ſphere, having for its baſe a circle equal to the ſuperficies of the ſphere, or to

to four great circles of the ſphere, or to a circle whoſe radius is equal to the diameter of the ſphere, by 14th Prop. 2d part of this. And indeed a ſphere differs very little from the ſum of an infinite number of cones, that have their baſes in the ſurface of the ſphere, and their common vertex in the center of the ſphere: ſo that the ſuperficies of the ſphere, (of whoſe dimenſion ſee 14th Prop. 2d part of this) multiplied into the third part of the ſemidiameter, gives the ſolid content of the ſphere.

PROP. VII.

PROB. FIG. 6.

To find the ſolid content of a ſector of the ſphere.

A Spherical ſector ABC (as appears by the Corol. of the preceeding Prop.) is very little different from an infinite number of cones, having their baſes in the ſuperficies of the ſphere BEC, and their common vertex in the center. Wherefore the ſpherical ſuperficies BEC being found (by 15. Prop. 2d part),

part), and multiplied into the third part of AB the radius of the ſphere, the product will give the ſolid content of the ſector ABC.

COROLLARY.

It is evident how to find the ſolidity of a ſpherical ſegment leſs than a hemiſphere, by ſubtracting the cone ABC from the ſector already found. But if the ſpherical ſegment be greater than a hemiſphere, the cone correſponding muſt be added to the ſector, to make the ſegment.

PROP. VIII.

PROB. FIG. 7.

To find the ſolidity of the ſpheroid, and of its ſegments cut by planes perpendicular to the axis.

IN the 2d Prop. of this part, it is ſhown that every where EH : EG : : CF : CD ; but circles are as the ſquares deſcribed upon their rays, that is, the circle of the radius EH, is to the circle of the radius EG, as

CFq to CDq. And ſince it is ſo every where, all the circles deſcribed with the reſpective rays EH (that is the ſpheroid made by the rotation of the ſemiellipſis AFB around the axis AB) will be to all the circles deſcribed by the reſpective *radii* EG (that is the ſphere deſcribed by the rotation of the ſemicircle ADB on the axis AB) as FCq to CDq; that is, as the ſpheroid to the ſphere on the ſame axis, ſo is the ſquare of the other axis of the generating ellipſe to the ſquare of the axis of the ſphere.

And this holds, whether the ſpheroid be found by a revolution around the greater or leſſer axis.

COROLLARY 1.

Hence it appears, that the half of the ſpheroid, formed by the rotation of the ſpace AHFC around the axis AC, is double of the cone generated by the triangle AFC about the ſame axis; which is the 32d Prop. of *Archimedes*, of conoids and ſpheroids.

COROLLARY 2.

Hence likewiſe is evident the meaſure of ſegments of the ſpheroid cut by planes perpendicular

pendicular to the axis. For the ſegment of the ſpheroid made by the rotation of the ſpace ANHE, round the axis AE, is to the ſegment of the ſphere having the ſame axis AC, and made by the rotation of the ſegment of the circle AMGE, as CF*q* to CD*q*.

But if the meaſure of this ſolid be wanted with leſs labour, by the 34th Prop. of *Archimedes*, of conoids and ſpheroids, it will be as BE to AC + EB, ſo is the cone generated by the rotation of the triangle AHE round the axis AE, to the ſegment of the ſphere made by the rotation of the ſpace ANHE round the ſame axis AE; which could eaſily be demonſtrated, (was this a proper place for it), by the method of indiviſibles.

COROLLARY 3.

Hence it is eaſy to find the ſolid content of the ſegment of a ſphere or ſpheroid intercepted between two parallel planes, perpendicular to the axis. This agrees as well to the oblate as to the oblong ſpheroid; as is obvious.

COROL-

COROLLARY 4. FIG. 8.

If a caſk is to be valued as the middle piece of an oblong ſpheroid, cut by the two planes DC and FG, at right angles to the axis. Firſt let the ſolid content of the half ſpheroid ABCED be meaſured by the preceeding Prop.; from which let the ſolidity of the ſegment DEC be ſubtracted, and there will remain the ſegment ABCD; and this doubled, will give the capacity of the caſk required.

The following method is generally made uſe of for finding the ſolid content of ſuch veſſels. The double area of the greateſt circle, that is of that which is deſcribed by the diameter AB at the middle of the caſk, is added to the area of the circle at the end, that is of the circle DC or FG (for they are uſually equal), and the third part of this ſum is taken for a mean baſe of the caſk; which therefore multiplied into the length of the caſk OP, gives the content of the veſſel required.

Sometimes veſſels have other figures, different from thoſe we have mentioned; the eaſy methods of meaſuring which may be learned

learned from thoſe who practiſe this art. What hath already been delivered, is ſufficient for our purpoſe.

PROP. IX.

PROB. FIG. 9. and 10.

To find how much is contained in a veſſel that is in part empty, whoſe axis is parallel to the horizon.

LET AGBH be the great circle in the middle of the caſk, whoſe ſegment GBH is filled with liquor, the ſegment GAH being empty; the ſegment GBH is known, if the depth EB be known, and EH a mean proportional between the ſegments of the diameter AE and EB; which are found by a rod or ruler put into the veſſel at the orifice. Let the baſis of the caſk, at a medium, be found, which ſuppoſe to be the circle CKDL; and let the ſegment KCL be ſimilar to the ſegment GAH (which is either found by the rule of three, becauſe as the circle AGBH is to the circle CKDL, ſo is the ſegment GAH to the ſegment KCL;

KCL; or is found from the tables of ſegments made by authors); and the product of this ſegment multiplied by the length of the caſk, will give the liquid content remaining in the caſk.

PROP. X. PROB.

To find the ſolid content of a regular and ordinate body.

A Tetraedron being a pyramid, the ſolid content is found by the 2d Prop. of this part. The Hexaedron, or cube, being a kind of priſm, it is meaſured by the 1ſt Prop. of this part. An Octaedron conſiſts of two pyramids of the ſame ſquare baſe and of equal heights; conſequently its meaſure is found from the 2d Prop. of this part. A dodecaedron conſiſts of twelve pyramids having equal equilateral and equiangular pentagonal baſes; and ſo one of theſe being meaſured (by 2d Prop. of this) and multiplied by 12, the product will be equal to the ſolid content of the dodecaedron. The icoſiaedron conſiſts of 20 equal pyramids having triangular baſes; the

ſolid

ſolid content of one of which being found (by the 2d Prop. of this) and multiplied by 20, gives the whole ſolid. The baſes and heights of theſe pyramids, if you want to proceed more exactly, may be found by Trigonometry.

PROP. XI. PROB.

To find the ſolid content of a body however irregular.

LET the given body be immerſed into a veſſel of water, having the figure of a parallellopipedon or priſm, and let it be noted how much the water is raiſed upon the immerſion of the body. For it is plain that the ſpace which the water fills, after the immerſion of the body, exceeds the ſpace filled before its immerſion, by a ſpace equal to the ſolid content of the body however irregular. But when this exceſs is of the figure of a parallellopipedon or priſm, it is eaſily meaſured by the firſt Prop. of this part, to wit, by multiplying the area of the baſe, or mouth of the veſſel, into the difference of the elevations of the water before

fore and after immerſion. Whence is found the ſolid content of the body given. *Q. E. I.*

In the ſame way the ſolid content of a part of a body may be found, by immerſing that part only in water.

There is no neceſſity to inſiſt here on diminiſhing or enlarging ſolid bodies in a given proportion. It will be eaſy to deduce theſe things from the 11th and 12th books of *Euclid.*

" The following rules are ſubjoined for the " ready computation of the contents of veſ- " ſels, and of any ſolids in the meaſures in " uſe in *Great Britain.*

" I. To find the content of a cylindric veſſel " in *Engliſh* wine-gallons, the diameter of the " baſe and altitude of the veſſel being given " in inches and decimals of an inch.

" Square the number of inches in the " diameter of the veſſel; multiply this ſquare " by the number of inches in the height; " then multiply the product by the deci- " mal fraction .0034; and this laſt product " ſhall give the content in wine-gallons and " decimals of ſuch a gallon. To expreſs " the rule arithmetically; let D repreſent

" the

" the number of inches and decimals of " an inch in the diameter of the veſſel, " and H the inches and decimals of an " inch in the height of the veſſel; then " the content in wine-gallons ſhall be DDH " $\times \frac{14}{10000}$, or DDH $\times$ .0034. *Ex.* Let the " diameter D=51.2 inches, the height H " =62.3 inches, then the content ſhall be " 51.2 $\times$ 51.2 $\times$ 62.3 $\times$ .0034=555.27342 " wine-gallons. This rule follows from " Prop. 7. of the ſecond part, and Prop. " 3. of the third part; for by the former, " the area of the baſe of the veſſel is in " ſquare inches DD $\times$ .7854; and by the " latter, the content of the veſſel in ſolid in- " ches is DDH $\times$ .7854; which divided by " 231 (the number of cubical inches in a " wine-gallon) gives DDH $\times$ .0034, the con- " tent in wine-gallons. But though the " charges in the Exciſe are made (by ſtatute) " on the ſuppoſition that the wine-gallon " contains 231 cubical inches, yet it is ſaid, " that in ſale 224 cubical inches, the con- " tent of the ſtandard meaſured in *Guildhall* " (as was mentioned above) are allowed " to be a wine-gallon.

" II. Suppoſing the *Engliſh* ale-gallon " to contain 282 cubical inches, the content " of a cylindric veſſel is computed in ſuch " gallons, by multiplying the ſquare of the " diameter of a veſſel by its height as former- " ly, and their product by the decimal fracti- " on .0027851. That is, the ſolid content " in ale-gallons is DDH × .0027851.

" III. Suppoſing the *Scots* pint to con- " tain about 103.4 cubical inches (which is " the meaſure given by the ſtandards at *Edin-* " *burgh*, according to experiments mentioned " above) the content of a cylindric veſſel is " computed in *Scots* pints, by multiplying " the ſquare of the diameter of the veſſel by " its height, and the product of theſe by the " decimal fraction .0076. Or the content of " ſuch a veſſel in *Scots* pints is DDH × .0076.

" IV. Suppoſing the *Wincheſter* buſhel to " contain 2187 cubical inches, the content " of a cylindric veſſel is computed in thoſe " buſhels by multiplying the ſquare of the " diameter of the veſſel by the height, and " the product by the decimal fraction " .0003606. But the ſtandard buſhel ha- " ving been meaſured by Mr *Everard* and

" others

" others in 1696, it was found to contain " only 2145.6 ſolid inches; and therefore " it was enacted in the act for laying a duty " upon malt, *That every round buſhel, with a " plain and even bottom, being* $18\frac{1}{2}$ *inches dia- " meter throughout, and* 8 *inches deep, ſhould " be eſteemed a legal* Wincheſter *buſhel.* Ac- " cording to this act (ratified in the firſt year " of Queen *Anne)* the legal *Wincheſter* buſhel " contains only 2150.42 ſolid inches. And " the content of a cylindric veſſel is computed " in ſuch buſhels, by multiplying the ſquare " of the diameter by the height, and their " product by the decimal fraction .0003652. " Or the content of the veſſel in thoſe " buſhels is DDH × .0003652.

" V. Suppoſing the *Scots* wheat firlot to " contain $21\frac{1}{4}$ *Scots* pints, (as is appointed " by the ſtatute 1618), and the pint to be " conform to the *Edinburgh* ſtandards above " mentioned, the content of a cylindric veſ- " ſel in ſuch firlots is computed by multiply- " ing the ſquare of the diameter by the " height, and their product by the decimal " fraction .00358. This firlot, in 1426, is " appointed to contain 17 pints; in 1457, " it

" it was appointed to contain 18 pints; in " 1587, it is 19¼ pints; in 1628, it is 21¼ " pints: and though this laſt ſtatute appears " to have been found on wrong computa- " tions in ſeveral reſpects, yet this part of the " act that relates to the number of pints in the " firlot ſeems to be the leaſt exceptionable; " and therefore we ſuppoſe the firlot to con- " tain 21¼ pints of the *Edinburgh* ſtandard, " or about 2197 cubical inches; which a " little exceeds the *Winchester* buſhel, from " which it may have been originally copied.

" VI. Suppoſing the bear firlot to contain " 31 *Scots* pints (according to the ſtatute " 1618) and the pint conform to the *Edin-* " *burgh* ſtandards, the content of a cylindric " veſſel in ſuch firlots is found by multiply- " ing the ſquare of the diameter by the height " and this product by .000245.

" When the ſection of the veſſel is not a cir- " cle, but an ellipſis, the product of the great- " eſt diameter by the leaſt is to be ſubſtituted " in thoſe rules for the ſquare of the diameter.

" VII. To compute the content of a veſ- " ſel that may be conſidered as a *fruſtum* of " a cone in any of thoſe meaſures.

" Let

" Let A repreſent the number of inches " in the diameter of the greater baſe, B " the number of inches in the diameter of " the leſſer baſe. Compute the ſquare of " A, the product of A multiplied by B, and " the ſquare of B, and collect theſe into " a ſum. Then find the third part of this " ſum, and ſubſtitute it in the preceeding " rules in the place of the ſquare of the " diameter; and proceed in all other re- " ſpects as before. Thus, for exam- " ple, the content in wine gallons is " $\overline{AA + AB + BB} \times \frac{1}{3} \times H \times .0034$.

" Or to the ſquare of half the ſum of the " diameters A and B, add one third part of " the ſquare of half their difference; and " ſubſtitute this ſum in the preceeding rules " for the ſquare of the diameter of the veſ- " ſel; for the ſquare of $\frac{1}{2}A + \frac{1}{2}B$ added to " $\frac{1}{3}$ of the ſquare of $\frac{1}{2}A - \frac{1}{2}B$, gives $\frac{1}{3}$ " $AA + \frac{1}{3}AB + \frac{1}{3}BB$.

" VIII. When a veſſel is a *fruſtum* of " a parabolic conoid, meaſure the diame- " ter of the ſection at the middle of the " height of the *fruſtum*; and the content " will be preciſely the ſame as of a cylin-

" der

" der of this diameter, of the ſame height with the veſſel.

" IX. When a veſſel is a *fruſtum* of a " ſphere, if you meaſure the diameter of the " ſection at the middle of the height of the " *fruſtum*, then compute the content of a " cylinder of this diameter of the ſame " height with the veſſel, and from this ſub- " tract $\frac{1}{3}$ of the content of a cylinder of the " ſame height on a baſe whoſe diameter is " equal to its height; the remainder will give " the content of the veſſel. That is, if D " repreſent the diameter of the middle ſection, " and H the height of the *fruſtum*, you are " to ſubſtitute $DD - \frac{1}{3} HH$ for the ſquare " of the diameter of the cylindric veſſel in " the firſt ſix rules.

" X. When the veſſel is a *fruſtum* of a " ſpheroid, if the baſes are equal, the con- " tent is readily found by the rule in *p.* 97. " In other caſes, let the axis of the ſolid " be to the conjugate axis, as *n* to 1; let D " be the diameter of the middle ſection of " the *fruſtum*, H the height or length of " the *fruſtum*; and ſubſtitute in the firſt " ſix rules $DD - \frac{HH}{3nn}$ for the ſquare of

" the

" the ſquare of the diameter of the veſ-
" ſel.

" XI. When the veſſel is an hyperbolic
" conoid, let the axis of the ſolid be to the
" conjugate axis, as *n* to 1, D the diameter
" of the ſection at the middle of the *fruſtum*,
" H, the height or length: compute DD +
" $\frac{1}{3nn} \times$ HH, and ſubſtitute this ſum for the
" ſquare of the diameter of the cylindric veſ-
" ſel in the firſt ſix rules.

" XII. In general, it is uſual to meaſure
" any round veſſel, by diſtinguiſhing it into
" ſeveral *fruſtums*, and taking the diameter
" of the ſection at the middle of each *fru-*
" *ſtum*; thence to compute the content of
" each, as if it was a cylinder of that mean
" diameter; and to give their ſum as the
" content of the veſſel. From the total
" content computed in this manner, they
" ſubtract ſucceſſively the numbers which ex-
" preſs the circular areas that correſpond
" to thoſe mean diameters, each as often as
" there are inches in the altitude of the *fru-*
" *ſtum* to which it belongs, beginning with
" the uppermoſt; and in this manner cal-
" culate a table for the veſſel, by which

" it

" it readily appears how much liquor is at " any time contained in it, by taking either " the dry or wet inches; having regard to " the inclination or drip of the veſſel when " it has any.

" This method of computing the con- " tent of a *fruſtum* from the diameter of " the ſection at the middle of its height, " is exact in that caſe only when it is a " portion of a parabolic conoid; but in " ſuch veſſels as are in common uſe, the " error is not conſiderable. When the " veſſel is a portion of a cone or hyperbolic " conoid, the content by this method is " found leſs than the truth; but when it " is a portion of a ſphere or ſpheroid, the " content computed in this manner exceeds " the truth. The difference or error is al- " ways the ſame, in the different parts of " the ſame or of ſimilar veſſels when the " altitude of the *fruſtum* is given. And " when the altitudes are different, the error " is in the triplicate *ratio* of the altitude. " If exactneſs be required, the error in mea- " ſuring the *fruſtum* of a conical veſſel, in " this manner, is $\frac{1}{4}$ of the content of a " cone,

"cone, ſimilar to the veſſel, of an alti-
"tude equal to the height of the *fruſtum*.
"In a ſphere, it is $\frac{1}{3}$ of a cylinder of
"a diameter and height equal to the *fru-*
"*ſtum*. In the ſpheroid and hyperbolic co-
"noid, it is the ſame as in a cone gene-
"rated by the right-angled triangle contained
"by the two ſemiaxes of the figure revol-
"ving about that ſide which is the ſemiaxis
"of the *fruſtum*. Theſe are demonſtrated in
"a treatiſe of fluxions by Mr *Colin M'Laurin*,
"*p.* 22. and 715. where thoſe theorems are
"extended to *fruſtums* that are bounded by
"planes oblique to the axis in all the ſolids
"that are generated by any conic ſection re-
"volving about either axis.

"In the uſual method of computing a
"table for a veſſel, by ſubducting from the
"whole content the number that expreſſes
"the uppermoſt area as often as there are
"inches in the uppermoſt *fruſtum*, and after-
"wards the numbers for the other areas ſuc-
"ceſſively; it is obvious that the contents
"aſſigned by the table, when a few of the
"uppermoſt inches are dry, are ſtated a
"little too high, if the veſſel ſtands on its

" leſſer baſe, but too low when it ſtands on " its greater baſe; becauſe, when one inch " is dry, for example, it is not the area at " the middle of the uppermoſt *fruſtum*, but " rather the area at the middle of the upper- " moſt inch, that ought to be ſubducted from " the total content, in order to find the con- " tent in this caſe.

" XIII. To meaſure round timber, let " the mean circumference be found in feet " and decimals of a foot; ſquare it; multi- " ply this ſquare by the decimal .079577, " and the product by the length. *Ex.* Let " the mean circumference of a tree be 10.3 " feet, and the length 24 feet. Then " $10.3 \times 10.3 \times .079577 \times 24 = 202.615$, " is the number of cubical feet in the tree. " The foundation of this rule is, that when " the circumference of a circle is 1, the a- " rea is .079577471 5, and that the areas " of circles are as the ſquares of their cir- " cumferences.

" But the common way uſed by artifi- " cers for meaſuring round timber, differs " much from this rule. They call one fourth " part of the circumference the *girt*, which

" is

" is by them reckoned the ſide of a ſquare,
" whoſe area is equal to the area of the
" ſection of the tree; therefore they ſquare
" the *girt*, and then multiply by the length
" of the tree. According to their method,
" the tree of the laſt example would be
" computed at 159.13 cubical feet only.

" How ſquare timber is meaſured, will be
" eaſily underſtood from the preceeding Pro-
" poſitions. Fifty ſolid feet of hewn tim-
" ber, and forty of rough timber, make a
" load.

" XIV. To find the burden of a ſhip,
" or the number of tons it will carry, the
" following rule is commonly given. Multi-
" ply the length of the keel taken within
" board, by the breadth of the ſhip within
" board, taken from the midſhip-beam from
" plank to plank, and the product by the
" depth of the hold, taken from the plank
" below the keelſon to the under part of the
" upper deck plank, and divide the product
" by 94, the quotient is the content of the
" tonnage required. This rule however can-
" not be accurate; nor can one rule be ſup-
" poſed to ſerve for the meaſuring exactly

" the

" the burden of ſhips of all ſorts. Of this " the reader will find more in the Memoirs " of the royal academy of ſciences at *Paris* " for the year 1721.

" Our Author having ſaid nothing of " weights, it may be of uſe to add briefly, " that the *Engliſh* Troy-pound contains 12 " ounces, the ounce 20 penny-weight, and " the penny-weight 24 grains; that the *A-* " *verdupois* pound contains 16 ounces, the " ounce 16 drams, and that 112 pounds is " uſually called the hundred weight. It is " commonly ſuppoſed that 14 pounds *Aver-* " *dupois* are equal to 17 pounds Troy. Ac- " cording to Mr *Everard*'s experiments, one " pound *Averdupois* is equal to 14 ounces 11 " penny-weight and 16 grains Troy, that is, " to 7000 grains; and an *Averdupois* ounce " is 437½ grains. The *Scots* Troy-pound " (which by the ſtatute 1718, was to be the " ſame with the *French*) is commonly ſup- " poſed equal to 15¼ ounces *Engliſh* Troy, " or 7560 grains. By a mean of the ſtan- " dards kept by the Dean of Guild of *Edin-* " *burgh*, it is 7599$\frac{3}{32}$ or 7600 grains. They " who have meaſured the weights which

" were

" were ſent from *London*, after the union of " the Kingdoms, to be the ſtandards by " which the weights in *Scotland* ſhould be " made, have found the *Engliſh Averdupois* " pound (from a medium of the ſeveral " weights) to weigh 7000 grains, the ſame " as Mr *Everard*; according to which, the " *Scots*, *Paris*, or *Amſterdam* pound, will " be to the pound *Averdupois*, as 38 to 35. " The *Scots* Troy ſtone contains 16 pounds, " the pound two marks or 16 ounces, an " ounce 16 drops, a drop 36 grains. Twenty " *Scots* ounces make a Trone pound; but " becauſe it is uſual to allow one to the ſcore, " the Trone pound is commonly 21 ounces. " Sir *John Skene* however makes the Trone " ſtone to contain only 19½ pounds.

F I N I S.

A N

E S S A Y

ON A COURSE OF

LIBERAL EDUCATION

FOR

CIVIL AND ACTIVE LIFE.

WITH PLANS OF LECTURES ON

I. The Study of Hiſtory and general Policy.
II. The Hiſtory of England.
III. The Conſtitution and Laws of England.

TO WHICH ARE ADDED,

REMARKS

ON A

CODE OF EDUCATION,

Propoſed by Dr. BROWN, in a late TREATISE, intitled,

THOUGHTS ON CIVIL LIBERTY, &c.

By JOSEPH PRIESTLEY, LL.D.
TUTOR in the LANGUAGES and BELLES LETTRES
in the ACADEMY at WARRINGTON.

Printed for C. HENDERSON under the *Royal Exchange*:
T. BECKET and DE HONDT in the *Strand*; and by
J. JOHNSON and DAVENPORT, in *Pater-Noſter-Row*,
MDCCLXV.
Price, in Boards, 3s. 6d.

TO

JOHN LEES Esq.

PRESIDENT,

AND TO THE REST OF THE TRUSTEES

OF THE

ACADEMY

AT

WARRINGTON,

This ESSAY is,

WITH THE GREATEST RESPECT AND GRATITUDE, INSCRIBED,

BY THEIR MOST OBLIGED,

AND MOST OBEDIENT,

HUMBLE SERVANT,

JOSEPH PRIESTLEY.

2-20-37. 48J.

THE PREFACE.

TO prevent the reader from being led into any miſtake by the title of this performance, it will be proper to adverti ſe him, that he is not to expect from it, the entire method of conducting the education of a young gentleman deſigned to fill any ſtation in civil and active life, much leſs the methods which are peculiarly adapted to each department in it ſeparately conſidered. I only mean to point out one capital defect in the uſual method of educating young gentlemen, who are not deſigned for any of the learned profeſſions, in places of public and liberal education; and at the ſame time, in ſome meaſure, to ſupply that defect by giving a delineation of a ſet of lectures

tures equally uſeful for any department of active life; ſuch as has a nearer connection with their conduct in it, and therefore may bid fairer, both to engage their attention, and be of real uſe to them, than any branch of learning to which they have hitherto been made to apply, after they have left the Grammar-ſchool.

I hope the candid reader will not imagine, that the following SYLLABUSES *contain an account of all the articles which enter into the lectures. He will ſee, from the manner in which they are drawn up, that they contain only the principal heads of diſcourſe, ſuch as would more naturally engage the attention, in glancing over the lectures in a curſory manner; but, by the help of them, any perſon, acquainted with the ſubject, may eaſily conjecture the reſt. Let it be conſidered alſo, that they contain the heads of the lectures only in their preſent imperfect ſtate, capable of great additions and improvements, which the lecturer flatters himſelf they will receive in a greater, or leſs degree, every time he delivers them.*

I alſo hope the reader will confine his attention to the principal object of this performance, and excuſe both the errors of the preſs he may obſerve in it, and alſo other inaccuracies,

----------Quas aut incuria fudit,
Aut humana parum cavit natura.------

My

My general deſign is beautifully expreſſed in the following lines of Mr. Thomſon, deſcribing the future happy ſtate of Great Britain.

——————Inſtead of barren Heads,
Barbarian Pedants, wrangling Sons of Pride,
And truth-perplexing metaphyſic Wits,
MEN, PATRIOTS, CHIEFS, AND CITIZENS
are formed.

Liberty, part 5.

Imperfect as this performance may be, I ſhall think myſelf happy if I, in any meaſure, ſucceed in an attempt, which every friend to his country and mankind will think a laudable one.

With reſpect to the latter part of the work, viz. the REMARKS ON A CODE OF EDUCATION. *I hope it will not be generally thought, that I have expreſſed myſelf too freely, or too warmly, on ſubjects ſo intereſting as* RELIGIOUS LIBERTY, *and* FREE INQUIRY. *It was impoſſible either to avoid them, or to treat them with indifference. Religious liberty is the common cauſe of men, and free inquiry of ſcholars.*

ERRATA.

PAGE 11. l. 3. dele *of and*. — 25. l. 15. for *are written*, read *write*. — 28. l. 17. for *those*, read *these*. — 30. l. 11. read *than three*. — 32. l. 26. read *of so*. — 33. l. 11. for *the* read *their*. — 34. l. 10. dele *only*. — 48. l. 3. for *term* read *terms*. — Ib. l. 5. for *cut* read *cut*. — 97. l. 18. for *a* read *as*. — 149. l. 18. for *natural* read *national*. — 154. l. 9. for *as* read *a*. — 178. l. 29 read *the champions*. — 181. l. 9. for *a* read *every*. — 200. l. 14. for *religions* read *religious*.

AN ESSAY

ON A COURSE OF

LIBERAL EDUCATION

FOR CIVIL AND ACTIVE LIFE.

IT ſeems to be a defect in our preſent ſyſtem of public education, that a proper courſe of ſtudies is not provided for Gentlemen who are deſigned to fill the principal ſtations of active life, diſtinct from thoſe which are adapted to the learned profeſſions. We have hardly any medium between an education for the Counting-houſe, conſiſting of Writing, Arithmetic, and Merchants-Accounts, and a method of inſtitution in the abſtract

ſciences: ſo that we have nothing liberal, that is worth the attention of gentlemen, whoſe views neither of theſe two oppoſite plans may ſuit.

FORMERLY, none but the clergy were thought to have any occaſion for learning. It was natural, therefore, that the whole plan of education, from the Grammar-ſchool, to the finiſhing at the univerſity ſhould be calculated for their uſe. If a few other perſons, who were not deſigned for holy orders, offered themſelves for education, it could not be expected that a courſe of ſtudies ſhould be provided for them only. And, indeed, as all thoſe perſons who ſuperintended the buſineſs of education were of the clerical order, and had themſelves been taught nothing but the Rhetoric, Logic, and School-Divinity which comprized the whole compaſs of human learning for ſeveral centuries; it could not be expected that they ſhould entertain larger or more liberal views of education; and ſtill leſs, that they ſhould ſtrike out a courſe of ſtudy, for the uſe of men who were univerſally thought to have no need of ſtudy; and, of whom, few were ſo ſenſible of their own wants as to deſire any ſuch advantage.

BESIDES

BESIDES, in thoſe days, the great ends of human ſociety ſeem to have been but little underſtood. Men of the greateſt rank, fortune, and influence; and who took the lead in all affairs of ſtate, had no idea of the great objects of wiſe and extenſive policy; and therefore never apprehended that any fund of knowledge was requiſite for the moſt eminent ſtations in the community. Few perſons imagined what were the true ſources of wealth, power, and happineſs in a nation. Commerce was little underſtood, or even attended to; and ſo ſlight was the connection of the different nations of Europe, that general politics were very contracted. And thus, men's views being narrow, little previous furniture of mind was requiſite to conduct them. A man who was capable of managing a private eſtate, in the poor manner in which eſtates were then managed, had underſtanding enough to conduct the affairs of a nation.

THE conſequence of all this was, that the advances which were made to a more perfect and improved ſtate of ſociety were very ſlow; and the preſent happier ſtate of things was brought about, rather by an accidental concurrence of circumſtances, than by any efforts of human wiſdom and

foreſight. We ſee the hand of divine providence in thoſe revolutions which have gradually given a happier turn to affairs, while men have been the paſſive and blind inſtruments of their own felicity.

But the ſituation of things at preſent is vaſtly different from what it was two or three centuries ago. The objects of human attention are prodigiouſly multiplied; the connections of ſtates are extended; a reflection upon our preſent advantages, and the ſteps by which we have arrived to the degree of power and happineſs we now enjoy, has ſhewn us the true ſources of them; and ſo thoroughly awakened are all the ſtates of Europe to a ſenſe of their true intereſts, that we are convinced, the ſame ſupine inattention with which affairs were formerly conducted is no longer ſafe; and that, without ſuperior degrees of wiſdom and vigour in political meaſures, every thing we have hitherto gained will infallibly be loſt, and be quickly transferred to our more intelligent and vigilant neighbours. In this critical poſture of affairs, more lights and ſuperior induſtry are requiſite, both to miniſters of ſtate, and to all perſons who have any influence in ſchemes of public and national advantage; and conſequently a different and a better

furniture

furniture of mind is requiſite to be brought into the buſineſs of life.

THIS is certainly a call upon us to examine the ſtate of education in this country, and to conſider how thoſe years are employed which men paſs previous to their entering into the world: for upon this their future behaviour and ſucceſs muſt, in a great meaſure, depend. A tranſition, which is not eaſy, can never be made with advantage; and therefore it is certainly our wiſdom to contrive, that the ſtudies of youth ſhould tend to fit us for the buſineſs of manhood; and that the objects of our attention, and turn of thinking in younger life ſhould not be too remote from the deſtined employment of our riper years. If this be not attended to, we muſt neceſſarily be mere novices upon our entering the great world, be almoſt unavoidably embarraſſed in our conduct, and, after all the time and expence beſtowed upon our education, be indebted to a ſeries of blunders for the moſt uſeful knowledge we ever acquire.

IN what manner ſoever thoſe gentlemen who are not of any learned profeſſion, but who, in other capacities, have rendered the moſt important ſervices to their country, came by that knowledge which made them capable of it, I appeal to themſelves, whether

whether any conſiderable ſhare of it was acquired till they had finiſhed their ſtudies at the Univerſity. So remote is the general courſe of ſtudy at places of the moſt liberal education among us from the buſineſs of civil life, that many gentlemen, who have had the moſt liberal education their country could afford, have looked upon the real advantage of ſuch a liberal education as very problematical, and have either wholly diſpenſed with it in their own children; or, if they have ſent their ſons through the uſual circle of the ſchools, it has been chiefly through the influence of cuſtom and faſhion, or with a view to their forming connections which may be uſeful to them in future life. This appears by the little ſollicitude they ſhow about their ſons being grounded in thoſe ſciences, in which they themſelves might poſſibly have been conſiderable proficients, when they applied to them, but which, from their being foreign to the buſineſs of life in which they were afterwards engaged, they have now wholly forgotten.

INDEED, the ſevere and proper diſcipline of a Grammar-ſchool is become a common topic of ridicule; and few young gentlemen, except thoſe who are deſigned for

for ſome of the learned profeſſions, are made to ſubmit to the rigours of it. And it is manifeſt, that when no foundation is laid in a grammatical knowledge of the learned languages (which, in a large or public ſchool, cannot be done without very ſtrict diſcipline, and a ſevere application on the part both of the maſter and ſcholar) youth can be but ill qualified to receive any advantage from an univerſity education. Young gentlemen themſelves ſo frequently hear the learning which is taught in ſchools and univerſities ridiculed, that they often make themſelves eaſy with giving a very ſuperficial attention to it; concluding from the turn of converſation in the company they generally fall into, and which they expect to keep, that a few years will confound all diſtinction of learned and unlearned, and make it impoſſible to be known whether a man had improved his time at the univerſity or not.

THESE evils certainly call for redreſs; and let a perſon be reckoned a projector, a viſionary, or whatever any body pleaſes, that man is a friend of his country who obſerves and endeavours to ſupply any defects in the methods of educating youth. A well meaning and a ſenſible man may be miſtaken, but a good intention, eſpecially

if

if it be not wholly unaccompanied with good ſenſe, ought to be exempted from cenſure. What has occurred to me upon this ſubject I ſhall, without any further apology, propoſe to my fellow-citizens, and fellow-tutors, hoping that it will meet with a candid reception. It is true, I can boaſt no long or extenſive experience in the buſineſs of education, but I have not been a mere ſpectator in this ſcene; which, I hope, may exempt me from the ridicule and contempt which have almoſt ever fallen upon the ſchemes of thoſe perſons who have written only from their cloſets, and, without any experience, have raſhly attempted to handle this ſubject, in which, of all others, experiments only ought to guide theory; upon which hardly any thing worth attending to can be advanced *a priori*; and ~~where the greateſt geniuſes~~, for want of experience, have been the the greateſt viſionaries; laying ſchemes the leaſt capable of being reduced to practice, or the moſt abſurd if they had been put in practice.

Let it be remembered, that the difficulty under preſent conſideration is, how to fill up with advantage thoſe years of a young gentleman's life which immediately precede his engaging in thoſe higher ſpheres of

of active life in which he is deſtined to move. Within the departments of active life, I ſuppoſe to be comprehended all thoſe ſtations in which a man's conduct will conſiderably affect the liberty and the property of his countrymen, and the riches, the ſtrength, and the ſecurity of his country; the firſt and moſt important ranks of which are filled by gentlemen of large property, who have themſelves the greateſt intereſt in the fate of their country, and who are within the influence of an honourable ambition to appear in the character of magiſtrates and legiſlators in the ſtate, or of ſtanding near the helm of affairs, and guiding the ſecret ſprings of government. The profeſſion of Law, alſo, certainly comes within the above deſcription of civil and active life, if a man hope to be any thing more than a practiſing attorney; the profeſſion of Arms, too, if a gentleman have any expectation of arriving at the higher ranks of military preferment; and the buſineſs of Merchandiſe, if we look beyond the ſervile drudgery of the warehouſe or counting-houſe. Divines and Phyſicians I conſider to be intereſted in this ſubject, only as gentlemen and general ſcholars, or as perſons who converſe, and have influence with gentlemen engaged in active life,

without any particular view to their reſpective profeſſions.

THAT the parents and friends of young gentlemen deſtined to act in any of theſe important ſpheres, may not think a liberal education unneceſſary to them, and that the young gentlemen themſelves may enter with ſpirit into the enlarged views of their friends and tutors; I would humbly propoſe ſome new articles of academical inſtruction, ſuch as have a nearer and more evident connection with the buſineſs of active life, and which may therefore bid fairer to engage the attention, and rouſe the thinking powers of young gentlemen of an active genius. The ſubjects I would recommend are CIVIL HISTORY, and more eſpecially, the important objects of CIVIL POLICY; ſuch as the theory of laws, government, manufactures, commerce, naval force &c. with whatever may be demonſtrated from hiſtory to have contributed to the flouriſhing ſtate of nations, to rendering a people happy and populous at home, and formidable abroad; together with thoſe articles of previous information without which it is impoſſible to underſtand the nature, connections and mutual influences of thoſe great objects.

To give a clearer idea of the ſubjects I would propoſe to the ſtudy of youth at places of public of and and liberal education, I have ſubjoined plans of three diſtinct courſes of lectures, which, I apprehend, may be ſubſervient to this deſign, divided into ſuch portions, as experience has taught me, may be conveniently diſcuſſed in familiar lectures of an hour each.

THE firſt courſe is on the STUDY OF HISTORY in general, and in its moſt extenſive ſenſe. It will be ſeen to conſiſt of ſuch articles as tend to enable a young gentleman to read hiſtory with underſtanding, and to reap the moſt valuable fruits of that engaging ſtudy. I ſhall not go over the particulars of the courſe in this place: let the Syllabus ſpeak for itſelf. Let it only be obſerved, that my view was, not merely to make hiſtory intelligible to perſons who may chuſe to read it for their amuſement; but, principally, to facilitate its ſubſerviency to the higheſt uſes to which it can be applied; to contribute to its forming the able ſtateſman, an dthe intelligent and uſeful citizen. It is true, that this is comprizing a a great deal more than the title of the courſe will ſuggeſt. But under the head of *objects of attention to a reader of hiſtory*, it was found convenient to diſcuſs the principal of

thoſe ſubjects which every gentleman of a liberal education is expected to underſtand, though they do not generally fall under any diviſion of the ſciences in a courſe of academical education: and yet, without a competent knowledge of theſe ſubjects, no perſon can be qualified to ſerve his country except in the loweſt capacities.

THIS courſe of lectures, it is alſo preſumed, will be found to contain a comprehenſive ſyſtem of that kind of knowledge which is peculiarly requiſite to gentlemen who intend to travel. For, ſince the great objects of attention to a reader of hiſtory, and to a gentleman upon his travels are evidently the ſame; it muſt be of equal ſervice to them both, to have their importance and mutual influences pointed out to them.

IT will likewiſe be evident to any perſon who inſpects this ſyllabus, that the ſubject of COMMERCE has by no means been overlooked. And it is hoped, that when thoſe gentlemen, who are intended to ſerve themſelves and their country in the reſpectable character of merchants, have heard the great maxims of commerce diſcuſſed in a ſcientifical and connected manner, as they deſerve, they will not eaſily be influenced by notions adopted in a random and haſty manner, and from ſuperficial views of things;

things; whereby they might, otherwiſe, be ſometimes induced to enter into meaſures ſeemingly gainful at preſent, but in the end prejudicial to their country, and to themſelves and poſterity as members of it.

THE next courſe of lectures, the plan of which is briefly delineated, is upon the HISTORY OF ENGLAND, and is deſigned to be an exemplification of the manner of ſtudying hiſtory recommended in the former courſe; in which the great uſes of it are ſhown, and the actual progreſs of every important object of attention diſtinctly marked, from the earlieſt accounts of the iſland to the preſent time.

To make young gentlemen ſtill more thoroughly acquainted with their own country, a third courſe of lectures (in connection with the two others) is ſubjoined; viz. on its PRESENT CONSTITUTION AND LAWS. But the particular uſes of theſe two courſes of lectures need not be pointed out here, as they are ſufficiently explained in the introductory addreſſes prefixed to each of them.

THAT an acquaintance with the ſubjects of theſe lectures is calculated to form the ſtateſman, the military commander, the lawyer, the merchant, and the accompliſhed country gentleman cannot be diſputed.

The

The principal objection, which may be made to this ſcheme, is the introduction of theſe ſubjects into academies, and ſubmitting them to the examination of youth, of the age at which they are uſually ſent to ſuch places of education. It will be ſaid by ſome, that theſe ſubjects are too deep, and too intricate for their tender age and weak intellects; and that, after all, it can be no more than a ſmattering of theſe great branches of knowledge that can be communicated to youth.

To prevent being miſunderſtood, let it be obſerved, that I would not propoſe that this courſe of ſtudies ſhould be entered upon by a young gentleman till he be ſixteen or ſeventeen years of age, or at leaſt, and only in ſome particular caſes, fifteen years; at which time of life, it is well known to all perſons concerned in the education of youth, that their faculties have attained a conſiderable degree of ripeneſs, and that, by proper addreſs, they are as capable of entering into any ſubject of ſpeculation as ever they will be. What is there in any of the ſubjects mentioned above, which requires more accuteneſs or comprehenſion than algebra, geometry, logic, and metaphyſics; to which ſtudents are generally made to apply about the ſame age.

And if it be only a ſmattering of political and commercial knowledge &c. which can be acquired in the method I propoſe; let it be obſerved, that it is nothing more than the rudiments of any ſcience which can be taught in a place of education. The maſter of ſcience is a character of which nothing more than the outline is ever drawn at an Academy, or the Univerſity; it is never finiſhed but by aſſiduous and long continued application afterwards. And ſuppoſing that only the firſt rudiments, the grand, plain and leading maxims of policy, with reſpect to arts, arms, commerce &c. be communicated to a young gentleman, if they be ſuch maxims as he is really deſtined to purſue in life, is it not better that he have ſome knowledge of them communicated early, and at a time when it is likely to make the deepeſt and moſt laſting impreſſion, than to be thrown into the practice without any regular theory at all? It is freely acknowledged, that the man of buſineſs is not to be finiſhed at an academy, any more than the man of ſcience. This character is not the child of inſtruction and theory only; but, on the other hand, neither is it the mere offspring of practice without inſtruction. And, certainly, if a knowledge of theſe ſubjects be of any uſe, the earlier they

they are attended to (after a perſon be capable of attending to them to any purpoſe) and the more regular is the method in which they are taught, the greater chance there is for their being thoroughly underſtood.

When ſubjects which have a connection are explained in a regular ſyſtem, every article is placed where the moſt light is reflected upon it from the neighbouring ſubjects. The plaineſt things are diſcuſſed in the firſt place, and are made to ſerve as axioms, and as the foundation of thoſe which are treated of afterwards. Without this regular method of ſtudying the elements of any ſcience, it ſeems impoſſible ever to gain a clear and comprehenſive view of it. But after a regular inſtitution, any particular part of a plan of inſtruction may be enlarged at any time, with eaſe, and without confuſion. With how much more eaſe and diſtinctneſs would a perſon be able to deliver himſelf upon any ſubject of policy or commerce, who had had the whole ſubject, and every thing belonging to it explained to him in its proper connection, than another of the ſame abilities, who ſhould only have dipped into the ſubject in a random manner, reading any treatiſe that might happen to fall in his

his way, or adopting his maxims from the company he might accidentally keep, and, conſequently, liable to be impoſed upon by the intereſted views with which men very often both write and ſpeak. For theſe are ſubjects, on which almoſt every writer or ſpeaker is to be ſuſpected, ſo much has party and intereſt to do with every thing relating to them.

SINCE, however, theſe ſubjects do enter into all ſenſible converſation, eſpecially with gentlemen engaged in civil life, it is a circumſtance extremely favourable to the ſtudy of them, that converſation will come greatly in aid of the lectures the young gentlemen hear upon them. It cannot fail to rouſe their attention, and increaſe their application to their ſtudies, when they hear the ſubjects of them diſcuſſed by their fathers, and the elder part of their friends and acquaintance, for whoſe underſtanding and turn of thinking they have conceived a great eſteem. They will liſten with greater attention to grave and judicious perſons, and become much more fond of their company, when they are able to underſtand their converſation, and to enter occaſionally into it; when they can ſay, that ſuch a ſentiment or fact was advanced in their lectures, and that one of their fel-

low pupils, or themſelves made ſuch a remark upon it. It is no wonder that many young gentlemen give but little attention to their preſent ſtudies, when they find that the ſubjects of them are never diſcuſſed in any ſenſible converſation to which they are ever admitted. If ſtudying theſe ſubjects only ſerve to give the generality of young gentlemen a taſte for converſing upon them, and qualify them to appear to tolerable advantage in ſuch converſations, the variety of lights, in which they are viewed upon thoſe occaſions, cannot fail to make them more generally underſtood: and the better theſe ſubjects are undeſtood by the bulk of the nation, the more probable it is that the nation will be benefited by ſuch knowledge.

If I were aſked what branches of knowledge a young gentleman ſhould, in my judgment, be maſter of, before he can ſtudy this courſe with advantage; I would anſwer, that a knowledge of the learned languages is not abſolutely neceſſary, but is very deſirable; eſpecially ſuch an inſight into Latin as may enable a perſon to read the eaſier claſſics, and ſupercede the uſe of a dictionary, with reſpect to thoſe more difficult Engliſh words which are derived from the Latin. The ſtudent of this courſe ſhould underſtand French very well, he

ſhould

ſhould alſo be a pretty good accomptant, be acquainted with the more uſeful branches of practical Mathematics; and, if poſſible, have ſome knowledge of Algebra and Geometry, which ought to be indiſpenſable in every plan of liberal education.

Some will be ready to object to theſe ſtudies, that a turn for ſpeculation unfits men for buſineſs. I anſwer, that nothing is more true, if thoſe ſpeculations be foreign to their employment. It is readily acknowledged, that a turn for poetry and the Belles Lettres might hurt a tradeſman, that the ſtudy of natural philoſophy might interfere with the practice of the law, and metaphyſics and the abſtract ſciences with the duty of a ſoldier. But it can never be ſaid that a counſellor can be unfitted for his practice by a taſte for the ſtudy of the law; or that a commander would be the worſe ſoldier for ſtudying books written on the art of war: nor can it be ſuppoſed that a merchant would do leſs buſineſs, or to worſe purpoſe, for having acquired a fondneſs for ſuch writers as Sir Joſiah Child, Gee, Poſtlethwait, Tucker, &c. and for being qualified to read them with underſtanding and judgment.

It muſt be allowed, that the mechanical parts of any employment will be beſt

performed by perſons who have no knowledge or idea of any thing beyond the mere practice. When a man's faculties are wholly employed upon one ſingle object, it is more probable that he will make himſelf completely maſter of it; and, having no further or higher views, he will more contentedly and chearfully give his whole time to his proper object. But no man, who can afford the expence of a liberal Education, enters upon any buſineſs with a view to ſpend his whole life in the mere mechanical part of it, and in performing a taſk impoſed upon him. A man of ſpirit will laudably aſpire to be a maſter in his turn; when he muſt be directed by his own lights, and when he will find himſelf miſerably bewildered, if he have acquired no more knowledge than was ſufficient for him while he followed the direction of others. Beſides, in the caſe of merchandiſe, if one branch fail, there is no reſource but in more extenſive knowledge. A man who has been uſed to go only in one beaten track, and who has had no idea given him of any other, for fear of his being tempted to leave it, will be wholly at a loſs when it happens that that track can be no longer uſed; while a perſon who has a general idea of the whole courſe of the country may be able to

ſtrike

ſtrike out another, and perhaps a better road than the former.

I AM aware of a different kind of an objection, from another quarter, which it behoves me not to over-look. The advocates for the old plan of education, and who diſlike innovations in the number or the diſtribution of the ſciences in which lectures are given, may object to the admiſſion of theſe ſtudies, as in danger of attracting the attention of thoſe ſtudents who are deſigned for the learned profeſſions; and thereby interfering too much with that which has been found, by the experience of generations, to be the beſt for ſcholars, the proper ſubjects of which are ſufficient to fill up all their time, without theſe ſupernumerary articles. I anſwer, that the ſubjects of theſe lectures are by no means neceſſary articles of a mere ſcholaſtic education; but that they are ſuch as ſcholars ought to have ſome acquaintance with; and, that without ſome acquaintance with them, they muſt, upon many occaſions, appear to great diſadvantage, in the preſent ſtate of knowledge.

TIME was, when ſcholars might, with a good grace, diſclaim all pretenſions to any branch of knowledge but what was taught in the univerſities: perhaps, they would

be

be the more revered by the vulgar on account of ſuch ignorance, as an argument of their being more abſtracted from the world. Few books were written but by critics and antiquaries, for the uſe of men like themſelves. The literati of thoſe days had comparatively little free intercourſe but among themſelves; the learned world and the common world being much more diſtinct from one another than they are now. Scholars by profeſſion read, wrote, and converſed in no language but the Roman. They would have been aſhamed to have expreſſed themſelves in bad Latin, but not in the leaſt on being guilty of any impropriety in the uſe of their mother tongue, which they conſidered as belonging only to the vulgar.

But thoſe times of revived antiquity have had their uſe, and are now no more. We are obliged to the learned labours of our foreſathers for ſearching into all the remains of antiquity, and illuſtrating valuable ancient authors; but their maxims of life will not ſuit with the world as it is at preſent. The politeneſs of the times has brought the learned and the unlearned into more familiar intercourſe than they had together before. They find themſelves obliged to converſe upon the ſame topics. The

ſubjects

ſubjects of modern hiſtory, policy, arts, manufactures, commerce, &c. are the general topics of all ſenſible converſation. Every thing is ſaid in our own tongue, little is even written in a foreign or dead language; and every Britiſh author is ſtudious of writing with propriety and elegance in his native Engliſh. Criticiſm, which was formerly the great buſineſs of a ſcholar's life, is now become the amuſement of a leiſure hour, and this but to a few; ſo that a hundredth part of the time which was formerly given to criticiſm and antiquity is enough, in this modernized age, to gain a man the character of a profound ſcholar. The topics of ſenſible converſation are likewiſe the favourite ſubjects of all the capital writings of the preſent age, which are read with equal avidity by Gentlemen, Merchants, Lawyers, Phyſicians, and Divines.

Now when the courſe of reading, thinking, and converſation, even among ſcholars, is become ſo very different from what it was, is it not reaſonable that the plan of ſcholaſtic education ſhould, in ſome meaſure, vary with it? The neceſſity of the thing has already, in many inſtances, forced a change, and the ſame increaſing neceſſity will either force a greater and more general change,

change, or we muſt not be ſurpriſed to find our ſchools, academies, and univerſities deſerted, as wholly unfit to qualify men to appear with advantage in the preſent age.

In many private ſchools and academies, we find ſeveral things taught, which were never made the ſubjects of ſyſtematical inſtruction in former times; and in thoſe of our univerſities in which it is the intereſt of the tutors to make their lectures of real uſe to their pupils, and where lectures are not mere matters of form; the profeſſors find the neceſſity of delivering themſelves in Engliſh. And the evident propriety of the thing muſt neceſſarily make this practice more general, notwithſtanding the moſt ſuperſtitious regard to eſtabliſhed cuſtoms.

But let the profeſſors conduct themſelves by what maxims they pleaſe, the ſtudents will, of courſe, be influenced by the taſte of the company they keep in the world at large, to which young gentlemen in this age have an earlier admiſſion than they had formerly. How can it be expected that the preſent ſet of ſtudents for Divinity ſhould apply to the ſtudy of the dead languages with the aſſiduity of their fathers and grandfathers, when they find ſo many of the uſes of thoſe languages no longer

er ſubſiſting? What can they think it will avail them to make the purity of the Latin ſtyle their principal ſtudy, for ſeveral years of the moſt improveable part of their life, when they are ſenſible, they ſhall have little more occaſion for it than other gentlemen, or than perſons in common life, when they have left the univerſity? And how can it be otherwiſe, but that their private reading and ſtudies ſhould ſometimes be different from the courſe of their public inſtructions, when the favourite authors of the public, the merits of whom they hear diſcuſſed in every company, even by their tutors themſelves, are written upon quite different ſubjects.

In ſuch a ſtate of things, the advantage of a regular ſyſtematical inſtruction in thoſe ſubjects, which are treated of in books that in fact engage the attention of all the world, the learned leaſt of all excepted, and which enter into all converſations, where it is worth a man's while to bear a part, or to make a figure, cannot be doubted. And I am of opinion, that theſe ſtudies may be conducted in ſuch a manner, as will interfere very little with a ſufficiently cloſe application to other ſtudies. Students for Phyſic and Divinity may be admitted to theſe ſtudies later then thoſe for whoſe real uſe in life

they are principally intended; not till they be ſufficiently grounded in their Claſſics, have ſtudied Logic, Oratory, and Criticiſm; or any thing elſe which may be deemed uſeful, previous thoſe ſtudies which are peculiar to their reſpective profeſſions; and even then theſe new ſtudies may be made a matter of amuſement, rather than an article of buſineſs.

WITH reſpect to Divines, it ought moreover to be conſidered, that the ſame revolutions in the ſtate of knowledge, which call their attention to theſe new ſtudies have, in a great meaſure, furniſhed them with time for their application to them; by releaſing them from ſeveral ſubjects the ſtudy of which was formerly the great buſineſs of Divines, and engroſſed almoſt their whole time. And tho' new ſubjects have been ſtarted within the province of Divinity, it does not appear to me, that they require ſo much time and application as was uſually given to thoſe other ſtudies, the uſe of which is now ſuperſeded. I mean, principally, School-divinity, and the Canon law; not to mention Logic and Metaphyſics, which were formerly a more intricate buſineſs, and took up much more time than they do now.

But

LET a perſon but look over the table of contents to the works of Thomas Aquinas, which were read, ſtudied, or commented upon by all divines a few centuries ago, and he will be convinced, that it muſt have required both more acuteneſs to comprehend the ſubjects of them, and more time to ſtudy and digeſt them in any tolerable manner, than it would require to become exceedingly well verſed in all the branches of knowledge I would now recommend.

THE Canon law was not leſs complex than both the common and ſtatute law of England, and every clergyman of eminence was under a neceſſity of underſtanding, not only the general principles and theory of that ſyſtem, but even the minutiæ of the practice. Good ſenſe, and a free acceſs to the ſcriptures have at length (aſſiſted, perhaps, by an averſion to abſtract ſpeculations) thrown down the whole fabric of School-divinity, and the riſe of the Civil above the Eccleſiaſtical power in this realm has reduced the theory and practice of the Engliſh Canon law within very narrow bounds. And as to the little which remains in uſe, very few clergymen need trouble themſelves about it.

IT is acknowledged, that the attention of ſtudents for divinity, and other learned

profeſſions is much engaged by mathematical and philoſophical ſtudies, which have been much cultivated of late years. I rejoice in ſo valuable an acceſſion to human ſcience, and would be far from ſhortening the time which is given to them in places of liberal education. I rather wiſh there were more room for thoſe ſtudies in ſuch places, and better proviſion for teaching them. But, notwithſtanding this, there is room enough for a ſmall portion of time and attention to be given to the ſubjects I would here recommend; and it is not much of either that I would plead for, in the caſe of gentlemen intended for the learned profeſſions.

The method in which thoſe lectures may be taught to the moſt advantage, I apprehend to be the following; and experience has in ſome meaſure formed my judgment in this caſe.

Let the lecturer have a pretty full text before him, digeſted with care, containing not only a method of diſcourſing upon the ſubjects, but all the principal arguments he adduces, and all the leading facts he makes uſe of to ſupport his hypotheſes. Let this text be the ſubject of a regular, but familiar diſcourſe, not exceeding an hour at a time; with a claſs not exceeding twenty, or thirty.

Let

Let the lecturer give his pupils all encouragement to enter occaſionally into the converſation, by propoſing queries, or making any objections or remarks which may occur to them. Let all the ſtudents have an opportunity of peruſing this text, if not of copying it, in the intervals between the lectures, and let near half of the time for lecturing be ſpent in receiving from the ſtudents a minute account of the particulars of the preceding lecture, and in explaining any difficulties they might have met with in it; in order that no ſubject be quitted, till the tutor be morally certain his pupils thoroughly underſtand it.

Upon every ſubject of importance, let the tutor make references to the principal authors who have treated of it; and if the ſubject be a controverted one, let him refer to books written on both ſides of the queſtion. Of theſe references, let the tutor occaſionally require an account, and ſometimes a written abſtract. Laſtly, let the tutor ſelect a proper number of the moſt important queſtions which can ariſe from the ſubject of the lectures, and let them be propoſed to the ſtudents as exerciſes, to be treated in the form of orations, theſes, or diſſertations, as he ſhall think fit. Moreover, if he judge it convenient, let him appoint

point rewards to thoſe young gentlemen who ſhall handle the ſubject in the moſt judicious manner.

YOUNG gentlemen deſigned for the learned profeſſions need not be put upon theſe exerciſes, or reading all the authors referred to. It may be ſufficient for them to attend the lectures as they are delivered. And as I would not adviſe, that the lectures be given with ſhorter intervals between them three days, they cannot interfere much with their application to their proper ſtudies.

I think I could aſſign very ſatisfactory reaſons for each of the directions I have laid down above, but I flatter myſelf they will ſuggeſt themſelves; if not upon the bare peruſal, at leaſt upon any attempt to reduce them to practice. I ſhall only take notice of an objection which may be made to one particular article in this method.

SOME may object to the encouragement I would give the ſtudents to propoſe objections at the time of lecturing. This cuſtom, they may ſay, will tend to interrupt the courſe of the lecture, and promote a ſpirit of impertinence and conceit in young perſons. I anſwer, that every inconvenience of this kind may be obviated by the manner in which a tutor delivers himſelf

himſelf in lecturing. A proper mixture of dignity and freedom (which are ſo far from being incompatible, that they mutually ſet off one another) will prevent or repreſs all impertinent and unſeaſonable remarks, at the ſame time that it will encourage thoſe which are modeſt and pertinent.

But ſuppoſe a lecturer ſhould not be able immediately to give a ſatisfactory anſwer to an objection, which might be ſtarted by a ſenſible ſtudent. A tutor muſt be conſcious of his having made very ridiculous pretenſions, and having given himſelf improper airs, if it give him any pain to tell his claſs, that he will conſider a ſubject; or even to acknowledge himſelf miſtaken. It depends wholly upon a tutor's general diſpoſition, and his uſual manner of addreſs, whether he loſe, or gain ground in the eſteem of his pupils by ſuch a declaration. Every tutor ought to have conſidered the ſubjects on which he gives lectures with attention, but no man can be expected to be infallible. For my own part, I would not forego the pleaſure and advantage which accrue, both to my pupils and to myſelf, from this method, together with the opportunity it gives me of improving my lectures, by means of the many uſeful hints which are often ſtarted in this familiar

liar way of diſcourſing upon a ſubject, for any inconvenience I have yet found to attend it, or which I can imagine may poſſibly attend it.

I cannot help flattering myſelf, that were the ſtudies I have here recommended generally introduced, into places of liberal education, the conſequence might be happy and glorious for this country in ſome future period. Many of the political evils, under which this, and every country in the world labour, are not owing to any want of a love for our country, but to an ignorance of its real conſtitution and intereſts. Beſides the very circumſtance of giving that attention which I would recommend to its conſtitution, and intereſts would unavoidably beget a love and affection for them; and might, perhaps, contribute more to produce, propagate, and enflame a ſpirit of patriotiſm than any other circumſtance. And certainly, if there be the moſt diſtant proſpect of this valuable end being gained by an application to theſe ſtudies, it cannot fail to recommend them to every true lover of his country, in age when the minds ſo many are blinded and miſled by a ſpirit of faction; and, what is more alarming, when a taſte for luxury and expence is ſo high, that there is reaſon to fear it may, in many

caſes

caſes be ſuperior to all other regards, and when, in many breaſts, it already apparently threatens the utter extinction of a ſpirit of patriotiſm.

WHAT was it that made the Greeks, the Romans in early ages, and other nations of antiquity ſuch obſtinate patriots, that they had even no idea of any obligation ſuperior to a regard for their country, but that the conſtant wars they were obliged to maintain with the neighbouring nations kept the idea of their country perpetually in view, and always oppoſed to that of other nations? It is the ſame circumſtance which gives our common ſoldiers and ſeamen more of the genuine ſpirit of patriotiſm than is felt by any other order of men in the community, notwithſtanding they have the leaſt intereſt in it. Now the courſe of inſtruction I would introduce would bring the idea of our country more early into the minds of Britiſh youth, and habituate them to a conſtant and cloſe attention to it. And why ſhould not the practice of thinking, reading, converſing, and writing about the intereſt of our country anſwer the ſame purpoſe with the moderns, as fighting for it did among the ancients.

AND it is a circumſtance of particular conſequence, that this enthuſiaſtic love for

our country would by this means be imbibed by perſons of fortune, rank, and influence in whom it might be effectual to the moſt important purpoſes, who might have it in their power, not only to wiſh well to their country, but to render it the greateſt real ſervices. Such men would not only, as is the caſe with private ſoldiers or ſeamen, be able to employ the force of a ſingle arm only in its defence, but might animate the hearts, and engage the hands of thouſands in its cauſe. Of what unſpeakable advantage might be one miniſter of ſtate, one military commander, or even a ſingle member of parliament, who throughly underſtood the intereſts of his country, and who poſtponed every other intereſt and conſideration to it!

This is not teaching politics to low mechanics, and manufacturers, or encouraging the ſtudy of it among perſons with whom it could be of no ſervice to their country, and often a real detriment to themſelves; though we may ſee in thoſe perſons, how poſſible it is for the public paſſions to ſwallow up all the private ones, when the objects of them are kept frequently in view, and are much dwelt upon in the mind. The ſame zeal which is the ſubject of ridicule in perſons of no weight

or influence in the ſtate, would be moſt glorious and happy for their country in a more advantageous ſituation.

SOME may perhaps object to theſe ſtudies, as giving too much encouragement to that turn for politics, which they may think is already immoderate in the lower and middle ranks of men among us. But muſt not political knowledge be communicated to thoſe to whom it might be of real uſe, becauſe a fondneſs for the ſtudy might extend beyond its proper bounds, and be catched by ſome perſons who had better remain ignorant of it. Beſides, it ought to be conſidered, that how ridiculous ſo ever ſome may make themſelves by pretenſions to politics, a true friend of liberty will be cautious how he diſcourages a fondneſs for that kind of knowledge, which has ever been the favourite ſubject of writing and converſation in all free ſtates. Only tyrants, and the friends of arbitrary power ever took umbrage at a turn for political knowledge, and political diſcourſes among even the loweſt of the people. Men will ſtudy, and converſe about what they are intereſted in, eſpecially if they have any influence; and though the aſs in the fable was in no concern who was his maſter, ſince he could but carry his

uſual load, and though the ſubjects of a deſpotic monarch need not trouble themſelves about political diſputes and intrigues, which never terminate in a change of meaſures, but only of men; yet, in a free country, where even private perſons have much at ſtake, every man is nearly intereſted in the conduct of his ſuperiors, and cannot be an unconcerned ſpectator of what is tranſacted by them. With reſpect to influence, the ſentiments of the loweſt vulgar in England are not wholly inſignificant, and a wiſe miniſter will ever pay ſome attention to them.

It is our wiſdom, therefore, to provide that all perſons who have any influence in political meaſures be well inſtructed in the great and leading principles of wiſe policy. This is certainly an object of the greateſt importance. Inconveniences ever attend a general application to any kind of knowledge, and no doubt will attend this. But they are inconveniences which a friend to liberty need be under no apprehenſions about.

I may poſſibly promiſe myſelf too much, from the general introduction of the ſtudies I have recommended in this eſſay, in the places of liberal education; but a little enthuſiaſm is always excuſable in perſons who

who propoſe and recommend uſeful innovations. I have endeavoured to repreſent the ſtate of education in this view as clearly, and as fully as I have been able; and deſire my propoſals for emendations to have no more weight than the faireſt repreſentation will give them, in the minds of the cool and the unbiaſſed.

A SYLLABUS

A SYLLABUS OF A COURSE of LECTURES ON THE STUDY of HISTORY.

THE GENERAL DIVISION OF THE SUBJECT.

This courſe of lectures contains an account of,

I. THE general uſes of hiſtory.

II. THE ſources of hiſtory, with the principles on which paſt events may be aſcertained, and a particular illuſtration of Newton's Chronology.

III. WHAT is neceſſary or uſeful to be known previous to the ſtudy of hiſtory; including

including a ſummary of Chronology, and rules for eſtimating the riches and power of ſeveral nations, from the ſums of money mentioned in their hiſtories.

IV. DIRECTIONS for facilitating the ſtudy of hiſtory; including an account of ſeveral ingenious mechanical contrivances for this purpoſe.

V. THE order in which the moſt uſeful hiſtories may be read to the moſt advantage; including an account of all the capital ancient hiſtorians, and a more particular account of Engliſh hiſtorians, and Engliſh records.

VI. PROPER objects of attention to an hiſtorian; including the general principles of wiſe policy, and the theory of every thing which has contributed to the flouriſhing ſtate of nations.

VII. THE laſt article in this courſe is A GENERAL VIEW OF HISTORY CIVIL AND ECCLESIASTICAL, but for this, the author will at preſent make uſe of ſome of the compendiums of hiſtory recommended in the courſe of theſe lectures.

THE CONTENTS OF EACH PARTICULAR LECTURE.

LECTURE I. WHY Hiſtory is ſo generally pleaſing and intereſting.

intereſting. Hiſtory ſerves to amuſe the imagination and intereſt the paſſions. Advantage of hiſtory above fiction. It improves the underſtanding, and fits men for the buſineſs of life. Some advantages of hiſtory above experience. Peculiarly uſeful to princes. Facts eſſential to all knowledge. Political knowledge uſeful in every ſtation of life. Hiſtory frees the mind from many prejudices, and particularly national prejudices; but will confirm the attachment of a Briton to his country. The uſe of hiſtory to the ladies. All improvement in the ſcience of government derived from hiſtory.

LECTURE II. HISTORY tends to ſtrengthen the ſentiments of virtue: ſhown from the manner in which virtuous impreſſions are actually made upon the mind. Advantage of the ſtudy of hiſtory previous to a perſon's being introduced into the world. Why the repreſentations of hiſtorians are almoſt univerſally favourable to virtue. What kind of ſcenes hiſtory actually exhibits which are favourable to virtue. A view of the ſentiments and conduct of great men inſpires the mind with a taſte for ſolid glory and true greatneſs. Hiſtory enables us to form juſt ideas both of the ſtrength and weakneſs of human nature. Inſtances of both, with reflections.

LECTURE

LECTURE III. HISTORY tends to ſtrengthen the ſentiments of virtue by the variety of views in which it exhibits the conduct of Divine providence, ſhowing important events brought about by inconſiderable means, or contrary to the intention of thoſe perſons who were the principal agents in them. A regard to Divine providence heightens our ſatisfaction in reading hiſtory, and tends to throw an agreeable light upon the moſt gloomy and diſguſting parts of it. Hiſtory, in the misfortunes and hardſhips to which the moſt diſtinguiſhed perſonages have been reduced, gives a deep conviction of the inſtability of all human things, prepares our minds to ſubmit to adverſity with reſignation, and makes us acquieſce in the more humble ſtations of life. Laſtly, the moſt common obſervations on the tempers and manners of men, ſuch as we may collect every day from common life, affect us much more ſtrongly when we ſee them exemplified in the hiſtory of great perſonages. At what age hiſtory ought to be read. In what ſenſe proper for every age.

LECTURE IV. OF the SOURCES of hiſtory. Importance of records. What have been the principal methods of tranſmitting to poſterity the knowledge of e-

vents, with the advantages and imperfections of each. Oral tradition. Dependent and independent evidence. their values eſtimated algebraically. To eſtimate the value of ſingle evidences. Hiſtorical examples. The corruption of tradition exemplified in eccleſiaſtical hiſtory, and the ancient hiſtory of Egypt. Difference between ancient and modern times with reſpect to the communication of intelligence.

LECTURE V. Of Hiſtorical Poems. Thoſe of Homer and Oſſian. Public monuments with traditional explications. Hiſtorical cuſtoms. Hiſtorical names of perſons, countries and towns, &c. Monuments with emblematical, and alphabetical inſcriptions.

LECTURE VI. Of coins and medals. Their origin and uſe in Hiſtory. The principal information we receive from them. The progreſs of letters traced by their means. Addiſon's uſe of medals. Ancient and modern coins compared, with a view both to hiſtory and taſte. Of the origin and uſe of Heraldry.

LECTURE VII. The tranſition from public monuments to written hiſtories. Records and archives of ſtates. At what time chronology began to be attended to. Early methods of noting the intervals of time.

time. At what time the hiſtory of this weſtern part of the world begins to be credible. Ancient hiſtorians to be preferred who write of the events of their own times. Modern hiſtory beſt underſtood a conſiderable time after the events.

LECTURE VIII. OF THE INDIRECT METHODS OF COLLECTING THE KNOWLEDGE OF PAST EVENTS. The uſe of books not properly hiſtorical. The works of poets, and orators, and the remains of artiſts of all kinds. Difficulty of a writer's concealing his age and country from a ſagacious reader. The fictions of Annius of Viterbo. The hiſtorical uſe of Cicero's letters. Several inſtances of Newton's ſagacity in tracing events by means of connected circumſtances. Uſe of language to an hiſtorian, in tracing the number or degree of revolutions in a ſtate. How far any circumſtances in the language of a country may be a guide in judging of the original genius and manners of the people. Exemplified in the Hebrew and Roman tongues. A curious obſervation of Mr. Hume's on the uſe of correlative terms in languages. Of ſimplicity or refinement in languages.

LECTURE IX. CONNECTION of hiſtory and law. The ſtate of paternal and

filial affection among the Romans, as ſeen by the tenor of the civil law. Cuſtoms and general maxims of the ſame uſe as laws. Uſe of laws in tracing the original genius and manner of life of a people. Change in laws correſponding with a change of manners exemplified in the feudal ſyſtem in England. Simplicity or intricacy of law. Hale's inferences from a law of Canute's.

LECTURE X. The uſe of obſervations on the intervals between the generations of men and ſucceſſions of kings, to aſcertain the dates of paſt events. The antiquity of theſe methods of noting intervals of time. Fallacious method of computing by them. Eaſy correction of that fallacy: by which Newton has amended the chronology of ancient kingdoms and nations. The interval between the return of the Heraclidæ and the battle of Thermopylæ determined by ſucceſſions: the ſame interval aſcertained by generations. The time of the Argonautic expedition determined by two different courſes of generation. Extravagance of the Greek chronology. Improbable circumſtances in the commonly received chronology of Rome. The time of the ſiege of Troy comes to be the ſame, computing by ſucceſſions in Italy, and by ſucceſſions and generations in Greece.

And

And is agreeable to what Appian writes from the archives of Carthage.

LECTURE XI. The time of paſt events aſcertained by means of celeſtial appearances. The certainty of the method of computation by Eclipſes. A few ancient eclipſes enumerated. The uſe of them exemplified in the calculation of two ancient eclipſes, one of the ſun and another of the moon.

LECTURE XII. Of the uſe which Newton has made of obſervations on the preceſſion of the equinoxes in rectifying ancient chronology. The time of the Argonautic expedition determined by that means. The time of ſeveral ſubſequent events determined by the ſame means, in perfect conſiſtence with one another. A conjecture concerning the age of an old ſphere in the muſeum of the Farneſian palace. The age of Heſiod determined pretty nearly from his account of the heliacal riſing and ſetting of ſome ſtars. The uſe of the books of the Old Teſtament for rectifying the heathen chronology. The uſe it was of to Newton in particular.

LECTURE XIII. WHAT IS NECESSARY OR USEFUL TO BE KNOWN PREVIOUS TO A STUDY OF HISTORY. Uſe of the ſciences derived from hiſtory to a ſtudent

dent of hiſtory. The knowledge of human nature. Philoſophical knowledge in general. Geography. Chronology. Diviſion of the day. The method of reckoning by weeks.

LECTURE XIV. Months, lunar and ſolar. Intercalation. Cycles. Old and new ſtyle. The ſolar cycle. Cycle of Indiction. Julian period, difference in beginning the year. Æra's or Epocha's. The Æra of Nabonaſſar. Of the Seleucidæ. Of the birth of Chriſt. Of the Hegira. Uſed formerly in Spain. Of the battle of Actium. Of Diocleſian. Yeſdejerd. Cautions in comparing them with one another.

LECTURE XV. Of the methods of eſtimating the riches and power of ancient and remote nations. Sources of miſtake on this ſubject. Change in the ſtandard of Coin. Upon what the price of commodities depends. Of the ſtate of Indoſtan. The proper data to aſcertain the proportion of money to commodities. Of the changes which the Grecian coins underwent. Of the proportion between ſilver, gold, and braſs in ancient times. Of the changes in the Roman coins. Of the proportion of money to commodities in different periods of the Grecian and Roman hiſtory

tory. Of the intereſt of money in Greece and at Rome.

LECTURE XVI. Of the Engliſh coins. Saxon and Norman coins compared. When gold and copper began to be coined by our kings. A table of all the changes in the value of Engliſh coins. Proportion between gold and ſilver in different periods of our hiſtory. Proportion between coin and commodities in different periods of our hiſtory. A table of all the changes of the French coin from the time of Charlemaigne. A general idea of the proportion it has, at different times, borne to commodities in France. Of the different rates of intereſt in Europe in different periods. The number and riches of a people to be conſidered in computing the proportional quantities of the money they raiſe.

LECTURE XVII. DIRECTIONS FOR FACILITATING THE STUDY OF HISTORY. Uſe of compendiums. The beſt epitome's of hiſtory. Mechanical methods which have been uſed to facilitate the ſtudy of hiſtory. Chronological tables. Character of different tables. Sturt's tables. Genealogical tables.

LECTURE XVIII. CHART of hiſtory. Chart of Biography. Grey's Memoria

ria Technica. The method of a common place-book for the purpoſe of hiſtory.

LECTURE XIX. The term of FORTIFICATION explained, by the help of a model of all its varieties cut in wood; to enable young gentlemen to underſtand modern hiſtory, and the news-papers, and to judge of the progreſs of a ſiege.

LECTURE XX. A regular progreſs in hiſtory pleaſing. The order in which ancient general hiſtories may moſt conveniently be read, ſo as to make them one continued ſeries of hiſtory; together with the character of the hiſtorians as they are mentioned, and an account of thoſe paſſages in other authors which may ſerve to enlarge the hiſtory of the ſeveral periods of which they treat. Of Herodotus.

LECTURE XXI. Of Thucydides. Xenophon. Diodorus Siculus. Quintus Curtius. Arrian. Juſtin. Plutarch and Cornelius Nepos.

LECTURE XXII. DIONYSIUS Halicarnaſſenſis. Livy. Polybius. Appian.

LECTURE XXIII. SALLUST. Cæſar. Hirtius. Dio Caſſius. Paterculus. Suetonius. Tacitus.

LECTURE XXIV. AURELIUS Victor. Herodian. Scriptores Romani. Eutropius. Zozimus. Zonaras. Jornandes.

nandes. Ammianus Marcellinus. Procopius. Agathias. Nicetas Acominatus. Nicephorus Gregoras. Johannes Cantacuzenus. Uſe of books of antiquities. Writers who have explained coins and inſcriptions. Uſe of a knowledge of the civil law. Of modern compilations of hiſtory. The univerſal hiſtory. Hooke's Roman hiſtory.

LECTURE XXV. Of the method of ſtudying the ENGLISH HISTORY. Original writers recommended. Gildas. Bede. Nennius. Hoel Dha's Laws. Geoffrey of Monmouth. Caradocus. Roman writers of Engliſh affairs. Their defects how ſupplied. Fulneſs of Engliſh hiſtory from the times of chriſtianity accounted for. Saxon records. Saxon Chronicle. Aſſer Menevenſis. Ethelward. Verſtegan. Sheringham. What foreign hiſtories are uſeful to a knowledge of the Engliſh affairs in early times. Of the Daniſh, Iſlandic, German, and Norwegian antiquities.

LECTURE XXVI. The Engliſh hiſtory from the conqueſt. Ingulfus of Croiland. Marianus Scotus. Florentius Bravonius. Eadmerus. William of Malmeſbury. Simeon of Durham. Ealred. Henry of Huntingdon. William of Newbery.

Gervaſe of Canterbury. Roger de Hoveden. Ralph de Diceto. Matthew Paris. Chronicle of Mailros. Thomas Wicks. Nicholas Trivet. Roger Ciſtrenſis. John Brompton. Walter of Hemmingford. Ralph Higden. John vicar of Tinmouth. Matthew of Weſtminſter. Henry Knighton. Froiſſart. Thomas of Walſingham. William Caxton. John Roſs.

LECTURE XXVII. ROBERT Fabian. Polidore Virgil. Edward Hall. Hollingſhead. Stow. Speed. Baker. Clarendon, Whitlocke, and Ludlow. Burnet. Rapin. Hume. Robertſon. Parliamentary hiſtory. Grey's Debates. Uſe of private letters, memorials, and other remains of men in public characters.

LECTURE XXVIII. HISTORIES of particular lives and reigns. Of William the Conqueror by William of Poictiers. Of Edward the II. by Thomas de la More. Of Henry V. by Titus Livius. Of Edward IV. by Haddington. Of Edward V. by Sir Thomas Moore. Of Henry VII. by Sir Francis Bacon. Of Henry VIII. by Lord Herbert of Cherbury. Edward VIth's own diary. Of Elizabeth by Camden, Lives written by Harris and others.

LECTURE XXIX. LIGHT thrown upon the civil hiſtory of England by the eccleſiaſtical

oleſiaſtical writers. Odericus Vitalis, &c. Burnet's hiſtory of the reformation. Cranmer's Memorials publiſhed by Strype. An acquaintance with the old Engliſh Law-books uſeful to an Engliſh hiſtorian. Cuſtumier de Normandy, Glanville. Bracton. Fleta. Hengham. Horn's Mirroir de Juſtice. Breton. Novæ Narrationes. Forteſcue de Laudibus legum Angliæ. Statham's Abridgement of Reports. Littleton and Coke. Doctor and Student. Fitzherbert de Natura Brevium. Year books, Reports, &c. Wood's Inſtitute.

LECEURE XXX. Of the English Records. Royal Proclamations. Diſpatches and inſtructions for foreign miniſters. Leagues, Treaties, and Memorials, &c. where to be found. Records of the old court of Chivalry. Agard's collections. Cotton's library. Records of foreign ſtates. Rymer's Fœdera. The green cloth. Acts of Parliament. Raſtal's Collections. Prynne's abridgement and others. Journals of both houſes. Summons of the nobility in Dugdale. Records in the courts of Weſtminſter. Diſpoſition of the records in the Tower.

LECTURE XXXI. The Petty-bag-office. The Maſter of the Rolls. Regiſ-

trum de Cancellaria. Lower Exchequer. The Pipe-office. The ſeveral Remembrancers. Doomſday book. The red book of the Exchequer. The black book. Teſta Nevilli. Records of the inferior Courts. Thoſe kept by the ſecretary of the Admiralty. The office of Ordnance. The libraries and muſeums of noblemen and private gentlemen. Uſe of the Britiſh muſeum. What records have been publiſhed. Formulare Anglicanum. Pedigrees of ancient families. Old accounts of expences and diſburſements in families. Ledger books, and other monaſtic records. Monaſticum Anglicanum by Dugdale. Notitia Monaſtica by Tanner. Univerſity Monuments. Hiſtoriola Oxonienſis. Wood's hiſtory and antiquities of Oxford. Black book of Cambridge. Lives of Engliſh writers by Leland and others. Regiſters in eccleſiaſtical courts.

LECTUE XXXII. HISTORIANS of other Nations. Where accounts of them are to be looked for. What ſufficient for an Engliſhman. Henault's hiſtory of France. Uſe of the Univerſal hiſtory. Thuanus. Guiciardin. Davila. Voltaire.

LECTURE XXXIII. THE MOST IMPORTANT OBJECTS OF ATTENTION TO A READER

A READER OF HISTORY. Different objects to different perſons. An acquaintance with the hiſtory of our own country uſeful to perſons in all ranks of life. Peculiar uſe of Biography. Biographia Britannica, and other Biographical writings. We ought particularly to attend to the connection of cauſe and effect in all the changes of human affairs. What prejudices to be more particularly guarded againſt. Aſcribing too much, or too little to general, or particular cauſes; too many, or too few cauſes. Inconveniences of both.

LECTURE XXXIV. GENERAL obſervations on political meaſures. When perſonal conſiderations may be ſuppoſed to influence public meaſures and when not. Difference between the true, and the declared motives to tranſactions, wars &c. All juſt reaſoning on the connection of cauſe and effect capable of being reduced to practice. Periods of hiſtory more particularly worthy of attention. The connection of Sacred and Prophane Hiſtory. The ſucceſſion of the four monarchies. Hiſtory of the Grecian commonwealths, why intereſting, and what to be learned from it.

LECTURE XXXV. The riſe and declenſion of the Roman empire. What inſtruction

inſtruction it affords. The Settlement of the Northern nations in the diſmembered provinces of the Roman empire, with their original laws and cuſtoms, as the foundation of the preſent European governments. What circumſtances contributed to render the hiſtory of Europe from the cloſe of the 15th century vaſtly more intereſting, and more deſerving of attention than before. The time when the hiſtory of Spain begins to be intereſting to the reſt of Europe. The ſame with reſpect to France. The northern crowns. Ruſſia. Pruſſia. Into what parts the whole period from the cloſe of the 15th Century to the preſent times may be divided. What are the moſt ſtriking objects of attention in other parts of the world, in the interval between the irruption of the Northren barbarians and the cloſe of the 15th century. The hiſtory of Aſia. And of Germany.

LECTURE XXXVI. The moſt remarkable periods in the Engliſh hiſtory. When the hiſtory of Scotland begins to be intereſting. The moſt intereſting periods in the hiſtory of literature and the arts, from the earlieſt antiquity to the preſent time.

LECTURE XXXVII. The moſt important periods in the hiſtory of COMMERCE pointed out. Every thing worthy

of

of attention in hiſtory which contributes to make a nation happy, populous, or ſecure. GOVERNMENT an eſſential article. Nature and objects of civil government, ſimple or complex. Various forms of it.

LECTURE XXXVIII. Reaſons for the prevalence of Deſpotiſm in early times. Advantages of monarchy. Diſadvantages of it. What circumſtances make the ſituation of a people moſt happy in deſpotic ſtates. What circumſtances always more or leſs controll deſpotiſm. Attachment of ſome nations to deſpotiſm.

LECTURE XXXIX. Advantages of Democracy. Connection of liberty and ſcience. Situation of republics with reſpect to defence. Severity of manners in republics. Severe puniſhments dangerous. The true ſupports of republican government. Danger of luxury. Equality of fortunes. Exorbitant power in magiſtrates dangerous. Number of voters.

LECTURE XL. Ariſtocracy how different from deſpotiſm. What depends upon the number of its members. Libels peculiarly obnoxious in this government. In what reſpects the preſent European monachies differ from the ancient monarchies. Their riſe. Peculiar advantage of them. Nobility. Theſe governments promiſe

promiſe to be laſting. Different ſituation of the female ſex in theſe governments and thoſe which are deſpotic. The nature of the Roman government. The happineſs of having the order of ſucceſſion in monarchies fixed. What form of government is moſt proper for extenſive empire. How the extremes of liberty and deſpotiſm approach. Of the diſtribution of different powers in a ſtate. What preſerved the Roman republic ſo long.

LECTURE XLI. How much government under any of theſe forms is preferable to a ſtate of barbariſm. Refinement in men's ideas keeping pace with improvements in government. The European governments, (and particularly the Engliſh) traced from their firſt riſe in the woods of Germany to their preſent form. The conſtitution of the ancient German ſtates. State of their armies. Diviſion of the conquered lands. Upon what terms held. How feuds became hereditary. How the Clergy became an eſſential part of the ſtate. Upon what terms the great Lords diſpoſed of their lands. Taxes of the feudal times. Power of a Lord over his vaſſals. Why allodial eſtates became converted into feudal. When this took place in England.

The

The method of adminiſtering juſtice. Where the ſupreme power was lodged.

LECTURE XLII. In what circumſtances the Feudal ſyſtem acquired ſtrength. The violence and inſecurity of thoſe times. Inconſiſtent with commerce. Ballance of power in thoſe times. Wager of battle. Private confederacies. Knight-Errantry. Cauſes of the decline of the Feudal ſyſtem. Expenſive wars. Progreſs in the arts. Improvements in the art of war.

LECTURE XLIII. Riſe of Corporations. Greater and leſſer Barons. State of land property and the alienation of it. When, and by what means the great blow was given to the Feudal ſyſtem by the diminution of the power of the greater barons in different parts of Europe. The riſe of the Engliſh Commons. The Declenſion of the ſyſtem not equal in all parts of Europe. Not the ſame in Scotland as in England. The reaſons of it. The remains of it at preſent in different parts of Europe, and with us. General obſervations on the progreſs and termination of the Feudal ſyſtem.

LECTURE XLIV. The expences of government. How moderate taxes operate. Exorbitant taxes. Taxes upon poſſeſſions or conſumptions. Their differ-

ent advantages and diſadvantages. A Poll-tax, in what circumſtances moſt tolerable. By whom a tax upon conſumptions ſhould be paid. Taxes upon exports. Farmers of taxes. National debts.

LECTURE XLV. OF LAWS. Simple or complex ſyſtems of law. Lenity or ſeverity of laws. Sanctions of laws. Connection of laws. Who ſhould be proſecutors. Who judges. Object of laws. Inquiſition. Certainty of laws. Maxims and forms of law. Laws defeating their own end.

LECTURE XLVI. THE theory of the progreſs of law, exemplified in the hiſtory of the criminal law. And in the progreſs of men's ideas and of laws concerning property. Hiſtory of laws. Profeſſion of law. Force of cuſtom.

LECTURE XLVII. THE influence of RELIGION on civil ſociety. In what circumſtances it has the greateſt force. The uſe of it in ſtates. Advantages reſulting from Chriſtianity in Europe. Abuſes of religion. Toleration and perſecution. In what circumſtances moſt violent. The connection of modes of religion with forms of government. The encroachment of the eccleſiaſtical upon the civil power. How prevented. What

makes

makes men more attached to one religion than to another.

LECTURE XLVIII. THE influence of PHILOSOPHY on civil affairs. The influence of the different ſects of the Greek philoſophy upon ſtateſmen and their meaſures in ancient hiſtory. Neceſſity of an attention to AGRICULTURE. How beſt encouraged. Bounties. Public granaries. Mutual influences of agriculture and commerce. Circumſtances attending the imperfection of agriculture. Imperfect ſtate of it in England a few centures ago.

LECTURE XLXIX. IN what manner ARTS AND MANUFACTURES increaſe the power of a ſtate. Importance of encouraging labour. Vaſt advantage of manufactures. particularly to England. The ſociety for the encouragement of arts, manufactures and commerce. The connection between Science and the Arts. On what circumſtances a taſte for ſcience depends. The conſequences of interruptions in ſcience. The uſual decline of the arts after they have been brought pretty near perfection. Why ſcience is not ſo apt to decline.

LECTURE L. THE advantage of COMMERCE to a ſtate. Its effects upon the minds of men. Active and paſſive

commerce. What is the moſt advantageous kind of commerce. Of Fiſheries. The importation of unwrought materials. The gain of the merchants and of the country compared. Ballance of trade. Influence of commerce on the value of land. And vice verſa. Interfering of the legiſlature in commerce. The Navigation-act. Reſtrictions upon commerce. Companies. Alienation of land. Loſs of commerce by perſecution.

LECTUE LI. Use of Colonies to a commercial ſtate. Difference between ancient and modern colonies. Importance of our American colonies. The entire ſubſerviency of a colony to the mother country. The ſituation of Ireland. Unreaſonable jealouſy of it. The Iſle of Man. Uniformity of weights and meaſures. Maxims with reſpect to money. Of the nature of exchange. In what caſes a great quantity of money is uſeful or hurtful to a ſtate, and how the increaſe of it operates to produce an improved ſtate of ſociety.

LECTURE LII. Of the intereſt of money: How its riſe or fall is influenced by the ſtate of commerce. Of Paper-money. Paper-credit. State of the North American colonies in this reſpect. The fluctuating nature of commerce exemplified

ed as a motive to attend to and improve our commerce. Benefits which have arisen from unsuccessful attempts to extend commerce.

LECTURE LIII. The consequences of a flourishing state of society deduced. What kinds of luxury are hurtful. How far the country in which luxury prevails is hereby rendered incapable of self-defence or the contrary. The temper of mind in luxurious and barbarous ages compared. The mischiefs of idleness. The state of virtue in the earlier and later periods of most histories. Effects of large capital cities. The dreadful consequence of a total depravity of manners. Gaming. Education.

LECTURE LIV. The Importance of an attention to lesser things than those discoursed of above. Influence of POLITENESS in a state. Manners of the ancients. What form of government is most favourable to politeness, state of diversions among the Greeks and Romans. The influence of the practice of domestic slavery on the minds of the ancients. Manners of the Feudal times. The rise and progress of politeness in Europe. The consequence of a free intercourse between the sexes. The reason of the high distinction with which the female sex is treated in Europe. How far the

the laws which regulate the treatment of women depend upon the climate of countries. Treatment of women in the Eaſt, among the Greeks, Romans, and barbarous nations.

LECTURE LV. Of the FOOD, the DRESS, and the HABITATIONS of the human ſpecies. The importance of attending to their gradual improvement. The great ſuperiority of the moderns to the ancients in a variety of reſpects mentioned.

Of the POPULOUSNESS of nations. The influence of good laws and government. Eaſy naturalization. What uſe of land will enable the people to ſubſiſt in the greateſt numbers upon it. Circumſtances by which to judge of the populouſneſs of ancient nations. How trade and commerce make a nation populous. Equal diviſion of lands. When machines to facilitate labour are uſeful, and when hurtful.

LECTURE LVI. GRAZING formerly deſtructive to populouſneſs in England. Incloſures when hurtful, and when uſeful. Neceſſity of induſtry. Of frugality. A taſte for expenſive living how hurtful to Rome in the Auguſtan age, and to us at preſent. Reaſon of the populouſneſs of China. Matrimony. Polygamy. The conſequence of a ſudden diminution of the numbers of

a people. Of monaſteries and nunneries. Influence of religion on the populouſneſs of a country. The Populouſneſs of ancient and modern nations compared. Methods of eaſily computing the numbers of people in a country.

LECTURE LVII. WHAT makes a nation SECURE. Natural ramparts. Advantage of an iſland. Importance of weapons. The alteration which the invention of gunpowder has made in the art of war. Reaſon why the firſt effects of it were not more ſenſible in Europe. Difference in the methods of fortification, and fighting at ſea of the ancients and moderns. The importance of diſcipline. Inconvenience of the feudal militia. What makes modern wars ſo extremely expenſive. The riſe of ſtanding armies in Europe. Why a nation is formidable after a civil war. The great military power of ancient nations accounted for. In what ſenſe populouſneſs contributes to make a nation ſtrong and ſecure.

LECTURE LVIII. OF confederacies. The balance of power in ancient and modern times. The conduct of different nations in extending and ſecuring their conqueſts. The Roman policy in war particularly noticed. The neceſſity of perſonal courage.

courage. Influence of liberty. The reaſon of ſome inſtances of deſperate valour in ancient times. The difference between the proportion of officers and their pay in ancient and modern times explained. The danger of employing mercenaries. Of buying off wars.

LECTURE LIX. A capacity of bearing the fatigues of war: more requiſite in the ancient manner of fighting. The advantage of poor nations over the rich. Why invaders have generally more courage than the invaded. The influence of opinion upon courage. The influence of religious ſentiments. Effects of violent perſonal hatred. Civil wars peculiarly bloody. Cauſes of Factions, duration of them, eaſily propagated in free governments. Dreadful effects of faction. The unfortunate ſituation of the Greek empire. Obſervations on the different durations of empires.

LECTURE LX. The hiſtorian directed to attend to whatever contributes to the improvement of USEFUL SCIENCE. Changes in the face of the earth. The Abbe de Bos's obſervation on the air of Italy. Changes with reſpect to the fertility of ſeveral countries, to what they are owing. Rivers which have changed their courſe.

Whatever

Whatever tends to make us better acquainted with HUMAN NATURE to be particularly attended to. In what reſpect hiſtory may aſſiſt us to correct the errors of a theory drawn from experience. Of NATIONAL CHARACTERS, whether depending upon climate, or other cauſes. VARIETIES AMONG MANKIND, in their moral ſentiments, in the make of the human body, the different diſeaſes to which men have been ſubject. The different vices which have prevailed in different ages. An attention to LANGUAGE recommended.

LECTURE LXI. AN attention to DIVINE PROVIDENCE IN THE CONDUCT OF HUMAN AFFAIRS recommended. The uſe of theſe obſervations in demonſtrating the divine attributes. Compariſon of this proof with that from the works of nature. Theſe reſearches cleared from the charge of preſumption. Great caution recommended. Methods and maxims of proceeding in theſe enquiries. Evidence of the ſtate of the world having been improved, and marks of its being in a progreſs towards further improvement: conſidered here only with reſpect to PERSONAL SECURITY and PERSONAL LIBERTY. The ſtate of perſonal ſecurity in Greece, Rome, and the feudal times of Europe, compared with

the ſtate of things at preſent. Number of ſlaves in ancient times, and during the prevalence of the feudal ſyſtem.

LECTURE LXII. The gradual advancement of RELIGIOUS KNOWLEDGE to be attended to, particularly in the propagation of CHRISTIANITY, and the circumſtances attending the Reformation. Objection to the goodneſs of God from the ſtate of WAR mankind have generally been in. War has always borne a leſs proportion to peace than we are apt to imagine. Reflections upon the ſlain in battle. How far the calamities of war extend. The benefit accruing to mankind from their diſpoſition to hoſtility. Mankind would have been in a worſe ſituation without it, and the wars which have ſprung from it, argued from general principles. The particular uſe of war ſhown in ſeveral caſes. Religion, liberty, and the ſciences have often been promoted by war.

LECTURE LXIII. BENEFICIAL effects of CONQUESTS. Made with the moſt eaſe where they are the moſt wanted. Benefits accruing to barbarous nations from conquering civilized ones, or from being conquered by them. The world a gainer by the Roman conqueſts, exemplified in ſeveral countries. Examples of men doing more good by their death than by their

lives,

lives. Advantages reſulting from the feudal wars, from the abuſes of Popery. Moral maxims of conduct deduced from our obſervations of the Divine Being producing good by means of evil.

TOGETHER with the ſtudy of hiſtory, I would adviſe, that more attention be given to GEOGRAPHY than I believe is generally given to it; particularly to that branch of it which may with propriety, be called COMMERCIAL GEOGRAPHY exhibiting the ſtate of the world with reſpect to commerce, pointing out the moſt advantageous ſituations for carrying it on; and more eſpecially, noting thoſe articles, in the natural hiſtory of countries which are, or may be, the proper ſubjects of commerce.

THIS branch of knowledge is, indeed, as yet very much confined. We are probably ſtrangers to ſome of the moſt uſeful productions of the earth on which we live: but a general attention once excited to the ſubject, by teaching it to youth in all places of liberal education, would be the beſt proviſion for extending it. Then, gentlemen, in their voyages and travels, would have their attention more ſtrongly engaged to every thing that ap-

peared new or curious. Alſo merchants, and captains of ſhips, would not neglect to bring home ſpecimens of a variety of articles, beſides thoſe which were the principal object of their voyage.

A KNOWLEDGE of CHEMISTRY is abſolutely neceſſary to the extenſion of this uſeful branch of ſcience. And it is a pleaſing proſpect to thoſe who wiſh well to the flouriſhing ſtate of commerce, that chemiſtry has, of late years, been more generally attended to than ever, and that it is daily introduced into more places of liberal education. What loſers men may be for want of commercial Geography, and of Chemiſtry, as a foundation for it, may be conceived from a variety of caſes. Without ſome knowledge of this kind, a man might for inſtance be digging for the ore of a baſer metal, and overlook another of much more value, which might lie in his way. So great an advantage might he miſs for want of knowing ſuch ores. And it is more than probable, that the countries to which we trade for articles of ſmall account are capable of furniſhing us with commodities of much greater value, and will be found to do it, as ſoon as our attention is ſufficiently awake to diſcover them.

THE

THE

INTRODUCTORY ADDRESS

TO THE

COURSE of LECTURES

ON THE

HISTORY of ENGLAND.

GENTLEMEN,

AFTER having recommended to you the ſtudy of GENERAL HISTORY, and given you the beſt aſſiſtance I was able for that purpoſe, I would now recommend to your more particular attention THE HISTORY OF YOUR NATIVE COUNTRY. In

the ſubject of the former courſe of lectures you were intereſted as men, in the preſent courſe, as Britons, and Engliſhmen. A knowledge of general hiſtory will enable you to account for preſent appearances in the world in general, but you muſt look into the annals of your own country to account for what you ſee at home; and without this hiſtorical knowledge, every news paper of daily occurrences will, in fact, be unintelligible to you.

An ordinary reader, indeed, is completely ſatisfied when he ſees in the papers, a detail of foreign events and domeſtic occurrences; what battles have been fought, or what alliances have been formed; who is in, and who is out in the public offices of ſtate, &c. In general, the bulk of mankind are content with ſeeing how things are, without looking far into the cauſes or conſequences of things.

But a philoſopher is not ſatisfied without endeavouring to ſee things, as much as poſſible, in all their connections and relations. He wiſhes to ſee how the preſent ſtate of things aroſe out of the preceeding, till he have traced the conſtitution, privileges, powers, and all the advantages of his country to the earlieſt accounts of them: and

and then, by comparing things of a ſimilar nature, he may hope to be able to form a judgment of the probable conſequences of things.

Besides, it is only a knowledge how things were actually brought to the ſtate in which they now are, that can enable us to judge how they may be improved. Thus our knowledge of the wrong ſteps which have been taken in conducting our commerce, agriculture, &c. may teach us how to avoid them; and when we ſee the beſt ſchemes laid fairly open to examination, we may ſee how they might have been amended. And he is certainly a bad citizen, who hath leiſure to make himſelf maſter of the hiſtory of his country, whence ſuch lights may be received, and yet neglects ſo uſeful a branch of knowledge.

For the political knowledge of no perſon, in a country, the conſtitution of whoſe government is ſo free as that of ours, needs to be merely ſpeculative. Every man who has connections has influence, by means of which, he may, in proportion to the importance of his character (to which knowledge gives great weight) bring his theories, more or leſs, into practice. Nor is there the leaſt occaſion for any man to go, like a knight-errant, out of his own

province, or quit his proper ſphere of life to do this. Beſides, I am not now addreſſing myſelf to low mechanics, who have no time to attend to ſpeculations of this nature, and who had perhaps, better remain ignorant of them; but to young gentlemen, who now have leiſure for ſtudying the hiſtory and intereſts of their country, and who will not want opportunity to recommend ſchemes of public utility, or influence to aſſiſt in carrying them into execution.

OPPORTUNITIES, of converſation, at leaſt every gentleman of a liberal education, or genteel fortune has, with men who are at or near the helm of affairs; and theſe are what no perſon, who has the intereſt of his country at heart, will neglect to improve for its advantage.

BUT a knowledge of the hiſtory of our country is, certainly, of more immediate uſe to thoſe perſons who may be called to bear an active part in its civil or military tranſactions; to thoſe who ſtand fair for being called to aſſiſt or preſide in its councils, direct its force, or to perform any thing which will probably enter into the hiſtory of their country. As every man's particular conduct in thoſe departments is only a part, and a continuation of a ſeries of

counſels

counſels, and of a train of exploits, which began before he was born, all the parts of which are ſtrictly connected, in an infinite variety of ways; it is evident, that no ſucceeding part, ſuch as every perſon muſt now act, can be well conducted with a regard to the preceding parts.

How ill qualified, for inſtance, would any military commander be to conduct a future war againſt France, who was wholly unacquainted with the conduct of the laſt war; when every new expedition and ſtratagem would, neceſſarily, have ſome kind of reference to, or be guided by, a view to a former expedition or ſtrategem. But the laſt war could not be underſtood without ſome knowledge of thoſe preceding it. In this manner we might argue the neceſſity of, at leaſt, a general knowledge of the whole of the Engliſh hiſtory to every Engliſh commander.

But the knowledge of hiſtory is ſtill more evidently neceſſary to a miniſter of ſtate. For every treaty which is made with any foreign power, and every meaſure which is taken with reſpect to it, muſt neceſſarily be adapted to the preceding tranſactions of every kind with the ſame nations. Perhaps a ſtill more intimate acquaintance with the hiſtory of our country

try may be neceſſary to every perſon who is concerned in enacting or adminiſtering our laws.

Even the conduct of a Divine, whether of the eſtabliſhment or a non conformiſt, muſt, in many particulars, be directed by a knowledge of the hiſtory of his country both eccleſiaſtical and civil. And the like is neceſſary or uſeful to every inhabitant of the country. Beſides what more inviting ſubject of contemplation can a recluſe perſon make choice of, than to trace the revolutions in church and ſtate which his own country has undergone, to enter into the cauſes of them, and ſee the manner of their operation.

It is with the paſt and the preſent ſtate of your own country, Gentlemen, that I ſhall, in the courſe of lectures we are now entering upon, endeavour to bring you acquainted. I have ſhown you already, in a former courſe, what are the authentic ſources from which the hiſtory of our country is derived, in a ſuccinct account of the moſt important of our ancient hiſtories, law-books, and records of all kinds: I ſhall now endeavour to give you an example of the uſe you may make of your collections from theſe materials, by exhibiting under each reign, or at ſome convenient periods, the

the ſucceſſive ſtate of every thing which has already been pointed out to you as a proper object of attention in your reading of hiſtory; ſo that you may diſtinctly ſee every important change they have undergone, from the earlieſt accounts of things to the preſent time.

And great pleaſure, I cannot help promiſing myſelf, and you, Gentlemen, in tracing the ſecurity, the commerce, the power, and all the great advantages of our country, from their firſt rude beginnings, and through all the violences of the feudal times, to the preſent glorious age.

Nor to forget however that we are citizens of the world at large, I ſhall, at proper periods, note all the great revolutions which have taken place in it, and be more particular in the notice I ſhall take of foreign events, in proportion as (upon the extenſion of European politics in later ages) our affairs have become more connected with them: though I propoſe to touch upon all political events but ſlightly, referring you, for that article of information, to the hiſtories which are already publiſhed, and be more particular than any other hiſtorians have been upon every other great object of attention.

THE

THE

PLAN of the COURSE of LECTURES

ON THE

HISTORY of ENGLAND.

THE method in which I have thought proper to explain the hiſtory of England is, to divide the whole into ſeparate periods, and to digeſt all the materials relating to each under certain important heads, pretty much in the manner of Gordon's geographical grammar. A regular ſyllabus need not be given of the whole of this courſe, becauſe it is not one ſubject, but a ſeries of ſubjects, each of which is treated

treated in ſimilar manner; ſo that the plan of one period is the ſame with the plan of any other.

THE reaſon which determined me to make choice of this method was its diſtinctneſs, and the eaſe with which it may be conſulted. If any perſon want to ſee the ſtate of arts, agriculture, commerce, &c. for any particular reign in the general hiſtories of England, a great deal of time is often loſt in looking for it, or even before one can find whether the author has attended to it or not: whereas, in this method, as every thing is claſſed under its proper head, it is ſeen, in a moment, what was the ſtate of any article we are enquiring about in any particular reign. And it is likewiſe perfectly eaſy to trace the progreſs of it, from the earlieſt to the lateſt times, without the leaſt confuſion or interruption, as the account of every article is kept as unmixed as poſſible with any thing foreign to it. Thus, it will be equally eaſy for a ſtudent, who has this work before him, to get a clear idea of the ſtate of every thing worth attending to in any reign, in its actual connections with every other object of attention; or, without taking in the whole at once, he may trace the hiſtory of any particular article,

as

as of our conſtitution, arts, laws, language, commerce &c. in its ſeparate progreſs.

BESIDES, an hiſtorian who collects materials for hiſtory is leſs likely to omit any thing of importance, when he has all his heads of enquiry before him, digeſted in a regular manner; and for want of this method, expreſs or concealed, many important articles are wholly omitted in our largeſt hiſtories.

ANOTHER important uſe of a hiſtory of England digeſted in this method, to ſtudents, will be its ſerving as a common-place-book of Engliſh hiſtory with the principal heads, and the chief materials under each head digeſted before hand, as a foundation for their own collections, whenever they may have opportunity and leiſure to make any.

THIS is, likewiſe, the beſt method for a ſupplement to all our general hiſtories. For this purpoſe, I have made the detail of political events pretty ſhort; generally an abridgement of Rapin; but the account of every thing relating to the internal ſtate of the nation, I have been able to make much fuller than it is given in any other hiſtory.

As ſome periods, or reigns, are much ſhorter then others, it cannot be expected that

that all the heads I have made uſe of ſhould occur in every one of them. In a ſhorter period a more general head is choſen; whereas in larger periods, particularly when any article underwent a remarkable revolution, it will be found branched out into its proper ſubdiviſions. In ſome reigns many of the articles may not occur at all; but then the ſtate of thoſe articles for that time may be found in the reigns before or after it, where they next occur. For many of the heads do not only contain an account of the ſtate of an article for that particular time, but give a general idea how it ſtood in former times, and how long it continued in the ſame ſtate, with a ſhort view of its ſubſequent changes; before thoſe changes be related in their proper place, with all their cauſes, circumſtances, and conſequences.

THE heads which moſt uſually occur in every period, or reign of importance are the following.

EVENTS.
RELIGION AND CHURCH HISTORY.
GOVERNMENT.
-----CIVIL.
-----MILITARY.
OFFICERS in the Government.
PEERAGE.

PEERAGE.
PARLIAMENT.
CONSTITUTION, or the balance of power in the ſeveral orders of the ſtate.
LAWS, including the general ſtate of Law, ſhewing our gradual removal from a ſtate of barbariſm.
ADMINISTRATION OF LAW, compriſing the hiſtory of the courts of law.
FEUDAL SYSTEM.
TENURES.
---------- MILITARY.
---------- SOCCAGE.
FRUITS OF TENURES.
DESCENT of LANDS.
ALIENATION of land property.
---------- involuntary, with the hiſtory of perſonal execution.
---------- voluntary.
---------- teſtamentary.
ENTAILS.
FORMS OF CONVEYANCE.
CORPORATIONS.
CRIMINAL LAW.
TRIALS.
PUBLIC GRIEVANCES.
SECURITY.
AGRICULTURE.
MINES.
COMMODITIES.

ARTS.

ARTS.
MANUFACTURES.
INLAND TRADE.
FOREIGN COMMERCE.
SHIPPING.
RICHES, LUXURY, &c.
PUBLIC WORKS.
LONDON.
NUMBER OF INHABITANTS.
FOOD.
DRESS.
CONVENIENCES.
---------- in houſes.
---------- cities.
---------- roads, &c.
LANGUAGE.
LETTERS.
LEARNING.
EDUCATION.
MANNERS.
SENTIMENTS.
WAR.
------ ARMY.
------ NAVY.
CUSTOMS.
TITLES EMBLEMS OF ROYALTY, COURT OFFICERS, &c.
DIVERSIONS.
COIN, AND THE COMPUTATION OF MONEY.

PRICE OF PROVISIONS.
REVENUE.
TAXES, FUNDS, &c.
MISCELLANEOUS EVENTS.
GREAT MEN WHO FLOURISHED IN THE PERIOD.
FOREIGN EVENTS.

BESIDES theſe titles, which occur in almoſt every reign, there are others which are convenient only in particular periods. And, to prevent confuſion, every occaſional article is claſſed under its proper head, though it occur ever ſo ſeldom, or but once in the whole hiſtory. The occaſional heads are ſuch as theſe. NAME. ORIGIN. DISTRIBUTION OF LANDS. SUCCESSION TO THE CROWN. PERSONS. IRELAND. SCOTLAND, &c. &c. &c.

AT the end of every diſtinct period, it is uſeful to exhibit to the ſtudents of Engliſh hiſtory a view of the ſtate of empires for that period, in the CHART OF HISTORY; and, in the CHART OF BIOGRAPHY, the ſtate of important lives for the ſame. But to exhibit the ſtate of hiſtory in this mechanical manner to the moſt perfection, the chart of hiſtory muſt be drawn over again, upon a new and a more perfect plan. Time muſt be repreſented in

in it as flowing uniformly, in the ſame direction, and with the ſame velocity with which it is made to flow in the Chart of Biography. The lecturer ſhould by all means, draw one out in this manner for the uſe of his claſs. The chart of hiſtory already publiſhed is excellent for the firſt production of the kind, but will make a falſe impreſſion upon the imagination, and miſlead the conception of young perſons, if it be not reformed in the manner here deſcribed.

THE

INTRODUCTORY ADDRESS

TO THE

COURSE of LECTURES

ON THE

LAWS of ENGLAND.

****

GENTLEMEN,

MAN is a being endowed with various powers, by which he is fitted for extenſive connections, and conſequently, for various and extenſive obligations. Moreover, the greater perfection we attain to, that is, the more we riſe above the

the brutes, and the more exalted happineſs we are capable of, the more complex, we may truly ſay, doth our internal frame grow; and, at the ſame time, the more extenſive, and the more intimate are the connections we are capable of forming with other beings. Conſequently, the more important is our conduct in ſo critical a ſituation, and the more attentive doth it behove us to be to every circumſtance belonging to it.

It is our great happineſs and advantage, that, complex as our ſituation in life is, we have faculties capable of comprehending it in all its important relations, and of deriving the greateſt benefit from it. But ſtill theſe great advantages we cannot reap, unleſs we carefully conſider our ſituation, and ſedulouſly endeavour to accommodate ourſelves to it.

If we conſider any particular ſtation in life, as that of a Magiſtrate, a Phyſician, a General, &c. we ſhall immediately ſee, that it is impoſſible, either to diſcharge the duties, or enjoy the advantages of it, without thoroughly underſtanding it. And this maxim is equally true, whether it be applied to thoſe ſituations which are peculiar to ſome men, or to thoſe which are common to great numbers of mankind, or

even to the whole human race. Nay the more comprehenſive is the capacity in which we view ourſelves, the greater number of our fellow creatures we ſee in the ſame ſituation with ourſelves, the more important are the duties which reſult from that ſituation, and the more it behoves us to ſtudy and attend to them. Thus the duties incumbent on us as men, and which oblige the whole human race, are the great duties of ſocial morality, the violation of which is a crime of the moſt heinous nature, and has the moſt fatal conſequences. For the ſame reaſon, the duties which we owe to the community of which we are members are greater, and a violation of them draws after it more dreadful conſequences, than a neglect of the duties of more contracted and private connections: as theſe are of more importance, and ſtronger obligation than the duties which, Moraliſts ſay, we owe only to ourſelves.

To apply theſe obſervations to the purpoſe for which I have introduced them. We find ourſelves members of a civil ſociety, in which our ſituation obliges us to have a conſtant intercourſe with great numbers of our fellow creatures, and the rules of this intercourſe were eſtabliſhed long before we came into the world.

Moreover,

Moreover, the nature of things is ſuch, that there is a neceſſity of obliging every member of the ſtate to conform to the preeſtabliſhed rules of it, whether he approve of them or not, or even whether he know them or not. And in ſuch an advanced and highly improved ſtate of ſociety, as that to which the inhabitants of Great Britain are arrived, theſe rules or laws muſt be very numerous and complex: alſo many of them muſt needs be very arbitrary, as well as complex, or ſuch as no perſon could conjecture by his own reaſon a priori, were the caſes propoſed to him. Many of our laws, likewiſe, took their riſe from ſituations which now no longer exiſt: ſo that they cannot be properly underſtood without a review of the preceding ſtate and conſtitution of the country. On ſeveral accounts, therefore, we may naturally imagine, it muſt require much ſtudy and application to underſtand a ſituation ſo complex as ours, and to know even the general rules by which our conduct muſt be governed; in order to prevent this large ſociety of which we are members from being thrown into confuſion.

It may be ſaid, that there is in the country, a ſet of men, whoſe profeſſion it is to underſtand the laws, and to aſſiſt o-

thers in complying with the forms of them. But, beſides that no man of common prudence would chuſe implicitly to truſt himſelf and his property in the hands of any ſet of men whatever, if he could poſſibly acquire lights ſufficient to direct his own conduct; how many ſituations are there, in which a man may be neceſſarily obliged to act wholly unprovided with any aſſiſtance, and yet, where his obſervation of, perhaps, ſome arbitrary forms will be neceſſary to ſecure himſelf, or to make an effectual proviſion for thoſe perſons who are moſt dear to him; as is remarkably the caſe with reſpect to wills.

And if it be of importance to underſtand the laws of our country with reſpect to our own conduct, and the inconveniences we may bring upon ourſelves by our ignorance of them, of much more importance is this knowledge to thoſe perſons whoſe fortune, and whoſe ſtation in life give them any degree of influence over their fellow ſubjects, and who may laudably indulge the ambition which their fortune, family, and connexions inſpire, of appearing in the character of magiſtrates, or legiſlators in the ſtate; to have a voice in its councils, and to be concerned in enacting and repealing its laws, and in regulating its whole internal

internal policy. It requires no words to ſhow, how abſolutely unqualified is the man of mere wealth and rank in life to fill theſe important ſtations, without a knowledge of thoſe laws, and that conſtitution of his country of which he is appointed the guardian. It is evidently as prepoſterous, as for a Phyſician to undertake to preſcribe medicines without knowing the ſtructure of the human body, and the manner in which medicines operate upon it.

INDEED, it is more than to be feared, that our excellent conſtitution itſelf has already been a great ſufferer by the ignorance of thoſe who have tampered with it. Had its laws been thoroughly underſtood by all perſons concerned in the making and adminiſtration of them, it would, at this time, have been a far more uniform and perfect ſcheme of policy than it is. Dr. Blackſtone has juſtly obſerved, that "the "general incapacity even of our beſt juries "of deciding, with any tolerable propriety, "in thoſe points of law in which they are "required to decide, has greatly debaſed "their authority, and has unavoidably "thrown more power into the hands of its "judges, to direct, to controll, and reverſe "their verdicts, than perhaps the conſtitu-"tion intended." And it is a juſt complaint

plaint that the excellent ſymmetry of our laws has been greatly deſtroyed by injudicious acts of parliament. As the ſame excellent author obſerves, "Almoſt all the "perplexed queſtions, almoſt all the nice- "ties, intricacies, and delays, which have "ſometimes diſgraced the Engliſh, as well "as other courts of juſtice, are owing o- "riginally, not to the common-law itſelf, "but to the innovations which have been "made in it by acts of parliament, loaden "(as Coke expreſſes it) with proviſo's, "and additions, and many times on a ſud- "den penned, and corrected, by men of "none or very little judgment in law."

IT is univerſally eſteemed the diſgrace of the Engliſh nation, that the gentlemen and ſcholars of it are generally ſo ſhamefully ignorant of that conſtitution which is their greateſt national glory, and which is regarded with admiration and envy by all foreigners. And not only doth this ignorance expoſe our nobility and gentry to the contempt of foreigners, when they are upon their travels; but it abſolutely unfits them for reaping the proper fruits of travel. The proper advantage of travel in a political view, it is univerſally allowed, muſt ariſe from comparing the conſtitution, laws, and cuſtoms of foreign nations with

thoſe

thoſe of our own: but how can this compariſon be made, or any judgment formed of the conſtitution and laws of other countries with reſpect to our own, when that conſtitution, and thoſe laws with which they are to be compared, are unknown.

It may ſeem, indeed, to be a matter of indifference, which of two things to be compared be known the firſt; but in this caſe, I apprehend, the difference is very great. Nay, in fact, it is only one of them, viz. the conſtitution of our own country, that can be known firſt. At home, a young gentleman has a better opportunity of procuring aſſiſtance in theſe ſtudies: he may more eaſily be ſhown the ſeveral ſprings in the machine of government, with what it is that puts them in motion, and what it is that is moſt liable to obſtruct their motions; but abroad, let a gentleman take whom he pleaſes as a tutor in his travels, as both his tutor and himſelf will be foreigners, his obſervations muſt be directed, almoſt wholly, by his own ſagacity. If a gentleman begin his travels wholly unacquainted with the nature of laws and government, he will not know what enquiries to make, or what objects to turn his attention to; and therefore he muſt almoſt neceſſarily return as ignorant, as he ſet

ſet out. Whereas, a perſon who goes abroad properly furniſhed with a knowledge of the nature of government in general, and of the conſtitution and laws of his own country in particular, will know at once how to conduct his enquiries, and where to get all the intelligence he wants.

At Rome, every boy was obliged to learn the twelve tables by heart; and, about the time of the conqueſt, every Engliſhman of a liberal education, and particularly the clergy, excelled in the knowledge of our municipal laws, whence the common proverb, *Nemo clericus niſi cauſidicus.* Unfortunately, the civil law, upon its reception in the ſtates of Europe, and introduction into this kingdom, engroſſed all the attention of the clergy (many of whom where foreigners, and had acquired a fondneſs for it, and ſkill in it, before they were preſented with livings in England) and from that time the ſtudy of our common law, inſtead of being made a ſubject of general and national concern, became the property of a particular profeſſion. But the time is come, Gentlemen, when it is beginning to find its way back again into the ſeats of learning and polite education. It has already got an eſtabliſhment at Oxford,

ford, and it cannot fail, in time, to recommend itſelf in every place of truly liberal education.

Besides, the ſtudy of the conſtitntion and laws of our country; independent of its obligation upon us as members of the ſociety, and perſonally intereſted in being acquainted with the rules to which our lives, our liberty, our property, &c. are ſubject; and independent alſo of any proſpect we may have of being called to aſſiſt in improving or adminiſtering thoſe laws, exhibits a ſcene which juſtly challenges the attention of a philoſopher, and promiſes him the moſt rational entertainment. Philoſophy and legiſlation were originally the ſame ſtudy, the regulations of ſociety being juſtly deemed the moſt important ſubject on which the ableſt men could employ their beſt faculties. And no wonder the ſubjects of Government and laws ſhould have been conſidered as the greateſt objects of attention which human life affords, ſince the happineſs of mankind more immediately depends upon them. If it be the province of Philoſophy to diſcover the properties of great objects; or, which is the ſame thing, to diſcover truths relating to them; and, with reſpect to things which are in a ſtate of perpetual fluctuation,

fluctuation, to trace the cauſes of their preſent ſtate, and judge of their progreſs in futurity; if variety joined with uniformity contribute to recommend a ſubject to a philoſopher, this ſubject, of laws and government, is a proper field for philſophical ſpeculation.

In one reſpect, indeed, the laws and government of no human ſociety afford ſo agreeable an object of contemplation as the works of nature, which are contemplated in natural philoſophy and aſtronomy, or as the more abſtract ſciences of algebra and geometry. In theſe we find all the variety we can wiſh, enough to exerciſe the moſt exalted faculties, and yet a perfect uniformity reigning through the whole; whereas the conſtitution and laws of all human ſocieties preſent too much contrariety and inconſiſtency. Yet there is ſo much uniformity in theſe ſyſtems, ſuch a connection of parts, and ſuch a tendency to the ſame great end in the conſtruction of the ſeveral parts of this machine of government, particularly in our conſtitution, and the tenor of our laws; that, notwithſtanding ſome real inconſiſtencies, the contemplation of them cannot fail to be highly entertaining to a philoſophical mind; eſpecially if the progreſs of our laws and

conſtitution

conſtitution be attended to, as having ariſen from the common principles of human nature, having varied with a natural ſucceſſion of circumſtances, and theſe, in an almoſt uninterrupted ſeries, growing more favourable to improvements and to happineſs.

To this account of the advantage accruing from this ſtudy, I may add, that without a knowledge of the conſtitution and laws of our country, it is impoſſible thoroughly to underſtand the hiſtory of it, by which means a ſtudious perſon would deprive himſelf of one of the greateſt pleaſures he can enjoy.

But the true reaſon why the Engliſh laws are not more ſtudied by the ſubjects of the Engliſh government, I am ſenſible, is not becauſe gentlemen and ſcholars among us do not think themſelves intereſted in the ſtudy of them, or that they apprehend the ſubject would not be pleaſing, provided they could once thoroughly underſtand it, but they are diſcouraged by the great difficulties attending the ſtudy. Indeed, it has not been with this as with other ſciences. In them the diſtribution of the ſubjects, and the method of teaching have generally improved with the enlargement of the ſcience itſelf; whereas, in this caſe

caſe, the ſubject was actually grown beyond meaſure complex almoſt before any perſon ever thought of reducing it into method. And the attempts which have hitherto been made to methodize the vaſt body of our laws have not been ſo effectual, but that there is room for further improvement. But I flatter myſelf that I ſhall find myſelf leſs embarraſſed than others have been, becauſe I propoſe to do leſs than they have done.

All I intend, Gentlemen, in the preſent courſe of lectures, is to give, what may be called, the outline of the conſtitution of the Engliſh government, to lay down the general maxims and principles of it, and to remove the firſt obſtructions, which lie in the way of this ſtudy; in order to encourage and enable you to enter more thoroughly into the ſubject in your own private reſearches. My buſineſs is not to make you lawyers, but to add to the proper accompliſhments of gentlemen and ſcholars. I do not propoſe to inſtruct you in the arts of a profeſſion, but to diſcourſe with you upon our laws and government, as an important ſubject of ſcience, and a branch of real and uſeful knowledge, without which I cannot help looking upon a liberal education as defective in a moſt eſſential part.

To

To make the plan of this courſe of lectures more eaſy to myſelf, and more intelligible to you, I ſhall ſuffer myſelf to be guided, as much as poſſible, by the plan of the courſe you have already attended, on the ſtudy of hiſtory. You were there ſhown what are the greateſt and moſt important objects of attention to a reader of hiſtory, to a gentleman upon his travels, and, in ſhort, to every perſon who wiſhes to be an intelligent and uſeful member of ſociety. Now, in this courſe of lectures, I propoſe to ſhow you what the preſent ſtate of your own country affords that is moſt important under each of theſe heads, acquainting you what proviſion is made in our laws for ſecuring every object which you have been taught to conſider a moſt valuable in civil ſociety, as your lives, liberties, eſtates, &c.

I LIKEWISE propoſe to delineate to you the external form of our government, with reſpect to its civil, its military, and its eccleſiaſtical conſtitution, with the rank and duty of all the officers or magiſtrates in each of theſe departments. In ſhort, Gentlemen, I ſhall endeavour to ſhow you in what kind of a ſituation divine providence has placed you; that you may ſee

what rank you yourſelves hold in the community of which you are members; and that, knowing what your place in the ſociety is, you may know what is your duty, and what are your expectations.

A SYLLABUS

A SYLLABUS OF A COURSE of LECTURES ON THE CONSTITUTION AND LAWS of ENGLAND.

THE GENERAL DIVISION OF THE SUBJECT.

TO exhibit as diſtinct a view as poſſible of the whole ſtate of this country, I ſhall firſt conſider its CIVIL, and then its ECCLESIASTICAL conſtitution and laws. In laying down what relates to the civil ſtate of the kingdom, I ſhall be guided by a view to the great objects of all civil

policy; relating, in the firſt place, thoſe inſtitutions which tend to make us HAPPY, and conſequently POPULOUS at home; then thoſe which tend to make us FORMIDABLE abroad, and laſtly ſhow the manner in which the EXPENCES OF OUR GOVERNMENT are defrayed. In explaining the proviſion there is made, in our conſtitution and laws, for ſecuring the internal peace and happineſs of the ſtate, I ſhall conſider, I. The LEGISLATIVE power of the ſtate. II. The EXECUTIVE power. III. the LAWS of the ſtate. IV. The METHOD OF PROCEEDING IN THE COURTS, in order to obtain the benefit of the laws. When I conſider the laws of the ſtate, I ſhall, in the firſt place, explain thoſe regulations which are of a PUBLIC or more general nature; and then the mutual obligations of INDIVIDUALS to one another. Under the former of theſe heads, I ſhall place thoſe laws which have for their immediate object the preſervation of the government itſelf, thoſe which relate to trade and commerce, and to public conveniences of various kinds. Under the latter head I ſhall ſhew the proviſion which our laws have made to guard our lives, limbs, liberty, reputation, and property, real and perſonal; alſo thoſe which relate to the commerce of the ſexes,

and

and the domeſtic relations. After exhibiting the ſtate of the laws reſpecting natives, I ſhall conſider how they regard ALIENS; and when every thing relating to law has been diſcuſſed, the buſineſs of EQUITY will be explained.

BEFORE any part of this ſcheme be entered upon, it will be convenient to lay down the general DIVISION OF THE COUNTRY, and a deſcription of the ſeveral ORDERS OF MEN in it.

THE CONTENTS OF EACH PARTICULAR LECTURE.

LECTURE I. DIVISION OF THE COUNTRY, AND OF THE PEOPLE. Counties. Hundreds. Tythings. Dioceſes. Pariſhes. THE KING, AND THE ORDER OF HIS COURT. Order of ſucceſſion to the crown. Style, and ceremonies in attending upon him. Title. THREEFOLD ORDER OF THE BRITISH COURT. CIVIL order. The Lord Steward. His court and juriſdiction. Officers under him. The MILITARY order. The band of gentlemen penſioners. Their captain, and the officers under him. Yeomen of the guard. Troops of the houſhold. The

The horſe and foot guards. The ECCLESIASTICAL order of the court. The chapel royal, and its dean. The ſub-dean, twelve prieſts, and chapel clerk &c. Houſhold days, Chriſtmas, Eaſter, Whitſunday, and all Saints, with the ceremonies peculiar to each. Chaplains in ordinary. The king's cloſet, and the clerk of it. The king's almonry. The Lord Almoner. Ceremonies on thurſday in paſſion week. The civil-liſt revenue.

LECTURE II. THE queen conſort, her rank and privileges. Queen dowager. The prerogative of the Kings eldeſt ſon, the prince of Wales. The younger branches of the royal family. The NOBILITY. Peers by creation, deſcent, and preſcription. Dukes. Marquiſes. Earls. Viſcounts. Barons. Their antiquity ancient and preſent ſtate, &c. Titles and honours common to all the nobility; or peculiar to ſome of them, or to their ſons. Order of precedence among the nobility and their ſons. The privileges of Engliſh peers.

LECTURE III. OF the Engliſh GENTRY, Baronets. Knights batchelors. Knights-Bannerets. Eſquires. Gentlemen. Of the COMMONALTY. Yeomen. A general View of the privileges of the Engliſh commonalty. Of the order of the

the Garter. It's origin, officers, &c. Knights of the Bath. The office of Earl-Marſhal. The antiquity and uſe of coat-armour. The kings at arms. Garter. Clarencieux. Norroy. Their ſeveral offices. The ſix Engliſh Heralds and the Brunſwick herald. The purſuivants.

LECTURE IV. Of the ſupreme LEGISLATIVE power in the ſtate, as lodged in the king and the two houſes of PARLIAMENT. The members of theſe houſes for England, and Scotland. Their qualifications, and thoſe of the electors. Ancient ſtate of national repreſentation in the Engliſh parliament. Who may not ſit in Parliament, in conſequence of acts which have paſſed ſince the revolution. Laws relating to bribery and corruption in the election of the members of parliament. Method of ſummons. The power of each member. Laws and cuſtoms of parliament. Freedom of ſpeech in the houſe. Privileges of members out of the houſe. Reſtrictions which have been put upon theſe privileges, with reſpect to members who are criminals or debtors. The peculiar privileges of the Lords, as members of the houſe of Lords. The prerogatives of each of the two houſes. The manner in which bills are uſually paſſed. Adjourning

proroguing, and diſſolving the parliament. The ſpeaker of the houſe of lords, and other officers belonging to it, as the clerk of the crown, clerk of parliament, and uſher of the black rod, &c. The ſpeaker of the houſe of Commons. The nature and antiquity of his office. The officers of the houſe. Oaths to be taken by the members. The grand committee, and other committees of the houſe. Order of ſpeaking to bills, &c. method of promulgating the acts.

LECTURE V. Of the ſupreme EXECUTIVE power of the ſtate. The power and prerogatives of the KING, in domeſtic and foreign affairs. In what ſenſe he is the fountain of juſtice, of honour, of office, and of privilege, and the arbiter of domeſtic commerce. Of the inſtruments by which the power of the king is exerted. The kings PRIVY COUNCIL. How the members are choſen, and removed. The oath of the members. Method of conducting debates, ancient, and preſent power of the council. The preſident of the council. The cabinet council. The two principal SECRETARIES OF STATE. Their antiquity, ancient and preſent power. Their joint and ſeparate office. The ſignet-office.

fice. The paper-office. The privy ſeal. The great ſeal of the kingdom. The office of the LORD CHANCELLOR as keeper of it. The order in which grants, &c. paſs the ſeveral offices, before they come to the great ſeal.

LECTURE VI. THE power of adminiſtering the law. The nature of COURTS OF JUSTICE. Courts of record, and not of record. The office of Judge. Serjeants. Barriſters. Regiſters, &c. Attorneys at law. The Kings attorney-general. Sollicitor-general. The ſeparate power of the houſe of Lords and Commons, as courts of juſtice. The court of CHANCERY. Its twofold juriſdiction. The ordinary or legal court, and the buſineſs of it. The court of equity. A general view of the nature of it, and of the cauſes that come before it. The twelve maſters of chancery under the Lord high chancellor. The maſter of the rolls.

LECTURE VII. OF the court of King's-bench. Antiquity of it. The Lord chief juſtice of England, and the three other judges or juſtices of the kings bench. The extent of its authority. Its power over inferior courts. The diviſion of the court of kings-bench into the crown-

ſide

ſide and plea-ſide. Of the court of COMMON PLEAS. The Lord chief juſtice of the common pleas, and the buſineſs of this court. Officers belonging to it. Of the Court of EXCHEQUER. When erected. The two parts of the exchequer. The twofold juriſdiction of the judicial part of it. The court of equity in exchequer. The Barons of exchequer. The curſitor baron, and other officers. What buſineſs is uſually done in the court of exchequer, and the form of proceeding in it. The four terms in which the three courts mentioned in this lecture are open, Hilary, Eaſter, Trinity and Michaelmas.

LECTURE VIII. OF the INFERIOR COURTS of JUSTICE. The court of ASSIZES. The circuits. The commiſſions of the judges, and the extent of their power. The QUARTER SESSIONS. The buſineſs done there. Who are obliged to attend them. The PETTY SESSIONS. Of the TURN, the power of the Sheriff in it formerly. The COUNTY-COURTS, when their power was reduced. What buſineſs is now done in them. The HUNDRED COURTS. Their ancient and preſent ſtate. COURTS LEET. The original deſign of them, antient and preſent ſtate, &c.

LECTURE

LECTURE IX. COURTS OF PARTICULAR AND LIMITED JURISDICTION. The counties Palatine. The dutchy of Lancaſter. The counties corporate. The courts of the cinque-ports. The Lord warden of the cinque-ports. The reaſons for the ancient privileges of the cinque-ports. The ſtannary courts. The court of the mayor of the ſtaple. Of the law-merchant. The courts of the city of London. The extent of their juriſdiction and the officers who preſide in them. The courts of the univerſities of Oxford and Cambridge. Courts of conſcience. Courts-Baron, and courts of ancient demeſne, their ancient and preſent ſtate. Of the foreſt-laws. Officers in the foreſts. Juſtices in eyre. Regarder. Verderers, &c. The courts of woodmote, ſwainmote, and the courts of chief juſtice in the foreſt. Ancient and preſent ſtate of the foreſt laws and courts. General remarks on the ſtate of juriſdiction in England.

LECTURE X. OF the MAGISTRATES who act IN AN OFFICIAL CAPACITY, in the adminiſtration of the laws. Sheriffs. How nominated. Their judicial and miniſterial power. Officers under them. How far they are accountable for the conduct of theſe inferior officers. Bailiffs.

Bailiffs. Bailiffs of hundreds, and ſpecial Bailiffs. Jailers. Juſtices of the peace. When inſtituted. Their joint and ſeparate power. Coroners. The manner of taking an inqueſt. Treaſurers of counties. Origin and power of conſtables. Other officers ſimilar to conſtables. Penalties for negligence or oppreſſion by public officers in the adminiſtration of juſtice.

LECTURE XI. Of the ſeveral denominations of laws uſed in England. Commons law and ſtatute law. Equity. Foreign laws admitted in England. Uſe of the civil law. Of the canon law. Of the laws and the adminiſtration of them in Scotland, Ireland, Wales, Iſle of Man, Jerſey, Guernſey. Laws of a public nature, and firſt of thoſe laws which have for their immediate object, the preſervation of the government itſelf. Of the laws concerning Treason. The ſtatute of Edward the third explained. Of trials for high treaſon. Puniſhment. Who may be guilty of high treaſon. Other offences reſpecting the king's perſon palaces, &c. Of riots. The power of the ſheriff, &c. to ſuppreſs riots. Of the late acts concerning riots. Routs. Going armed with dangerous weapons, threatning letters. An affray.

LECTURE

LECTURE XII. Of the LAWS WHICH RESPECT PUBLIC TRADE AND COMMERCE. The regulation of fairs, and markets, ancient ſtate of markets. The court of Piepowders. Of Toll. In what circumſtances ſale in open markets does or does not alter the property of things ſold. The clerk of the market. The laws concerning foreſtalling, regrating and engroſſing, and alſo concerning monopolies. Of Apprentices. The mutual obligations of them and of their maſters, and their reſpective remedies for ill uſage. Poor apprentices. The proviſion that is made by our laws to keep arts and trades within the country. What materials of our manufactures are forbidden to be exported. Laws to prevent ſmuggling.

LECTURE XIII. Regulations concerning the COIN. What coin is current. Laws to prevent counterfeiting, impairing, or defacing the coin. Regulations of weights and meaſures. Laws concerning BANKRUPTCY. Who may be bankrupts. Method of iſſuing out a commiſſion of bankruptcy. Power of the commiſſioners. Aſſignees. Proviſion for bankrupts. Puniſhment of fraudulent bankruptcy. The famous Navigation-act. The Poſt-office, its origin, and preſent ſtate. An account

account of the eſtabliſhment and preſent ſtate of all the moſt conſiderable trading companies in England, and their reſpective legal privileges. The Eaſt India company. The Turky company. The ſociety of merchants adventurers. Ruſſia company. Eaſt-land company. The African trade. Of the board of trade. Of foreign conſuls.

LECTURE XIV. Laws providing for the public health. Selling unwholſome proviſions. Promoting the plague. Laws concerning ſeveral other matters of public convenience. Of the highways. Surveyors of the highways. Penalties for obſtructing or damaging them. Proviſion for the poor of the kingdom. How they were maintained before the reign of queen Elizabeth, and how ſince. Overſeers of the poor. Who may be compelled to provide for their poor relations. Of ſettlements. Of the interference of juſtices of the peace in appointing proviſion for poor perſons who apply to them. Houſes for the reception of the poor, and for obliging them to work. Houſes of correction for the diſſolute poor. Who may be ſent to them and compelled to hard labour. Officers in theſe houſes.

LECTURE

LECTURE XV. LAWS RELATING TO THE CONDUCT AND MUTUAL OBLIGATION OF INDIVIDUALS IN THE SOCIETY The proviſion that is made in our laws for ſecuring men's lives. Self-murder. Penalty. Murder. In what circumſtances a death will be deemed to be murder. Duelling. Killing officers of juſtice. Of manſlaughter. The ſtatute concerning ſtabbing. Of chance medley. Death per infortunium. Deodands. Se defendendo. Caſes of juſtifiable homicide.

LECTURE XVI. OF the proviſion which is made in our laws for the ſafety of our limbs. The laws concerning maiming and diſfiguring. Of battery, and aſſault. Laws in favour of perſonal liberty. Of Kidnapping. Laws relating to the writ of Habeas Corpus particularly that made in the reign of Charles II. Unlawful impriſonment. Laws which tend to ſecure men's reputation. Actions of the caſe for words. Laws concerning libels. Obſervations on them.

LECTURE XVII. THE care which our Laws have taken of our PROPERTY real, and perſonal. Previous definitions of terms reſpecting eſtates in land. Of the TENURES by which eſtates are held. Origin of tenures. Tenure by military ſervice, with

with its ancient varieties. Soccage eſtates, and their progreſs. Villenage. Ancient and preſent ſtate of that tenure. Modern copyholders. Of manors and honors, with the demeſnes, waſte, ſervices, court, and officers belonging to a manor.

LECTURE XVIII. ESTATES held by copy of court roll. Fines due upon them. Method of alienating them. Privileged villenage, or villan-ſoccage in lands of ancient demeſne. Origin of their privileges. Frankalmoin. DIVISION OF ESTATES ACCORDING TO THEIR QUANTITY OF INTEREST. Freehold, and leſs than freehold. Fee ſimple, what words in grants conſtitute it. Lands in abbeyance. Eſtates for life. Properties of all uncertain eſtates. What theſe tenants may do without committing waſte.

LECTURE XIX. Origin of modern Fees-tail. General and ſpecial. What may be intailed. Various methods which have from time to time been uſed to cut off intailed eſtates. ESTATES LESS THAN FREEHOLD. Eſtates of years. Eſtates at will. Eſtates at ſufferance. Of conditional eſtates.

LECTURE XX. OF eſtates in gage. Life-gage. Mortgage. Caſe of ſeveral mortgages upon the ſame eſtate. Eſtates

in

in expectancy. Remainders. What are eſſential to them, and who are capable of them. Remainders veſted or contingent. Method of conveyancing to prevent diſappointing contingent eſtates. An executory deviſe. Reverſions. Leſs eſtates merged in greater.

LECTURE XXI. Of eſtates with reſpect to THE NUMBER AND CONNECTION OF TENANTS. Eſtates in Jointenancy. Coparceners. Eſtates in common. The ſtatute of partition. The right of ſurvivorſhip in all the above-mentioned eſtates, and other properties of them.

LECTURE XXII. Of TITLES TO ESTATES, viz. by deſcent, or by purchaſe. Of the degrees of conſanguinity, lineal, and collateral. Different methods of computing thoſe degrees in different laws. The eight rules of deſcent, or canons of inheritance from Dr. Blackſtone explained. Gavelkind. Burrough Engliſh, &c. Who are incapable of being heirs. Heirlooms. How the heir is favoured by the laws of England.

LECTURE XXIII. Of eſtates acquired by purchaſe in its largeſt ſenſe. Different properties of eſtates by deſcent, and eſtates by purchaſe. What right in lands may

may at this day be acquired by occupancy. In what caſes the property of lands may be transferred by forfeiture. Crimes which occaſion forfeiture. Alienations in Mortmain. Origin and progreſs of the ſtatutes of mortmain. Alienation to aliens. Of waſte occaſioning forfeiture.

LECTURE XXIV. Of VOLUNTARY ALIENATION as made by deed, by matter of record, and by ſpecial cuſtom. Of the nature of Deeds in general. Deeds indented and deeds poll. Their ſeveral eſſential parts. What deeds are void. Deeds which convey real property, or CONVEYANCES, either by common law or by ſtatute. Conveyances by common law, original and primary, or derivative and ſecondary. Original conveyances, viz. Feoffments, Gifts, Grants, Leaſes, Exchanges, and Partitions. Of Feoffments. Livery and Seiſin. Livery in deed, and livery in law. Of entry.

LECTURE XXV. DEEDS of gift of lands entailed. Difference between gifts and grants. What words make them. Who may make them. Of the attornment of tenants. Statutes relating to it. Of leaſes. For how long they may be made without writing. Obligation to repairs. Of what things leaſes may be made. A deed

deed of exchange. What words make it, and what is neceſſary to its validity. A deed of partition. Of derivative conveyances, viz. Releaſes, confirmations, ſurrenders, aſſignments, and revocations. A deed of releaſe. By what words it is made. Of a general releaſe. A deed of confirmation. The forms and effect of it.

LECTURE XXVI. A DEED of ſurrender. Who may make it. A ſurrender by operation of law. The ſtatute of Charles II. concerning the neceſſity of writing, in order to aſſign, grant, or ſurrender eſtates. A deed of aſſignment. In what caſes it is uſually made, and by what words. To whom aſſignments may be made. What can, and what cannot be aſſigned. A deed of revocation. In what it differs from a diſſeaſance. What things are revocable. Of conveyances by ſtatutes. The ſtatute of uſes of Henry VIII. The occaſion and operation of it.

LECTURE XXVII. OF a covenant to ſtand ſeized to uſes. By whom and on what conſideration it may be made. Various kinds of uſes. Uſes at common law. A deed of bargain and ſale. What words create it. How its operation depends upon the ſtatute of uſes. What deeds of bargain and ſale may be enrolled, and within what time.

Method of computing time at common law. A deed of leaſe and releaſe. The nature of it, and its dependance upon the ſtatute of uſes.

LECTURE XXVIII. Of ALIENATION BY MATTER OF RECORD. Private acts of parliament: The kings grants. Of Fines. Original of this method of conveyancing. Who are bound by fines. Where they may be acknowledged. The parts of a fine. Fines with and without proclamations. The time allowed to enter a claim againſt a fine. The uſes of a fine. Of a Common-Recovery. The nature of this conveyance. The force of it. The parties to a recovery; viz. the demandant, tenant and vouchee. Recoveries with double or treble vouchers. Uſes of them. In what caſes recoveries are void, and in what caſes they are felony. After what time all common recoveries are valid. Where they may be ſuffered. Of deeds to lead to uſes, and deeds to declare uſes.

LECTURE XXIX. Of incorporeal hereditaments, viz. common, ways, offices, franchiſes, corodies, annuities, and rents. Of common. Different kinds of it. Common in groſs, appendant, appurtenant, and common becauſe of neighbourhood, with their

their ſeveral properties. Common of eſtovers, of piſcary, and of turbary. Of ways. Private and common ways. Who are to repair them. Of offices, What offices cannot be granted to heirs or in reverſion. Offices by common law and by ſtatute with their difference. What offices may be exerciſed by deputy and what not. What offices may be diſcharged by the grantor. Difference between public and private offices.

LECTURE XXX. Of FRANCHISES. A foreſt. A purlieu. A chace. A park. A warren. Their different obligations and privileges. Seizing the goods and chattels of felons. Treaſure-trove. Waifs. Strays. Wreck. And of jetſam, flotſam, and ligan. Statute of Edward the I. concerning wrecks. What franchiſes may be ſupported by record, and how they may be forfeited. Of corodies. What they were anciently. Difference between corodies and penſions.

LECTURE XXXI. Of annuities. Kinds of them. Of rents. Rent-ſervice. Rent-charge. Rent-ſeck. How rents may be recovered in a variety of caſes. The ſtatute of George II. concerning rents out of lands. Of preſcription, as giving a title to incorporeal hereditaments. The

difference between preſcription, cuſtom, and uſage. What is capable of being preſcribed to. What preſcriptions are extinguiſhed by unity of poſſeſſion.

LECTURE XXXII. OF THE INJURIES WHICH MAY BE DONE TO REAL PROPERTY AND the remedies againſt thoſe injuries, comprehending ouſter, treſpaſs, nuiſance, waſte, ſubtraction, and diſturbance. Of ouſter from freeholds and from chattels real. Ouſter from freeholds, effected by abatement, intruſion, diſſeizin, diſcontinuance, and deforcement. Their deſtinctions, and the rules of law reſpecting each of them. The remedies for all theſe kinds of ouſter; viz. by actual entry, action poſſeſſory, and by writ of right. How entry is made. In perſon or by proxy. Writ of forcible entry.

LECTURE XXXIII. OF poſſeſſory actions viz. writ of entry and writ of aſſize. Different degrees within which the writ of entry lies. What things put the writ of entry without the degrees. Title of entry. Writ of aſſize. Origin of the term. Aſſize of mordanceſtor and aſſize of nouvel diſſeiſin, with the rules reſpecting each. Of the writ of right. The writ of Formedon in its three hinds. The writ of right patent, and of right cloſe. The writ

writ of ejectione firmæ, for an eſtate for years How the forms of proceeding on this writ have been extended ſince the fourteenth of Henry VII. The manner of proceeding in trying titles to eſtates in this proceſs, and the rules of law reſpecting it. Method of remedy, when the king or his grant is ouſted. Writ of quo warranto. Writ of mandamus for refuſal to admit, or for wrongful removal of an officer.

LECTURE XXXIV. Of treſpaſs. What remedy the law affords. How far a man may relieve himſelf. Private nuiſances. What are ſuch, and what are not. Who may have an aſſize of nuiſance to remove it, and who can only have an action of the caſe to recover damages. How far a perſon may relieve himſelf in this caſe. Of Waſte. Different remedies in different caſes. What actions will be deemed waſte in a variety of caſes. Of ſubtraction of ſervices, and the remedy. Who may, and who may not diſtrain. Of what things a diſtreſs may be taken, and how they may be diſpoſed of. Laws reſtraining the rigour of diſtreſs. Act to prevent tenants from conveying away their goods, in order to prevent their being diſtrained. Operation of the writ of ceſſavit, and of the writ

of right ſur le diſclaimer. Of diſturbance.

LECTURE XXXV. Of the proviſion which our laws have made to ſecure that part of our property which is termed THINGS PERSONAL OR GOODS. How a title to them may be acquired or loſt. Occupancy. Difference between the laws of deſcent in land eſtates and in perſonalty. In what manner the goods of inteſtates were diſtributed formerly, and at preſent. What will amount to a gift of goods. What remedy the law affords when our goods are taken from us, Of larceny. Grand and petty larceny. Different puniſhments. How the adminiſtration of the laws ſoftens the ſeverity of them. Difference between this crime and breach of truſt. In what caſes a ſervant may be guilty of larceny.

LECTURE XXXVI. The care which our laws have taken of ſome of the more valuable kinds of our property. The variety of acts which have been made to prevent horſe-ſtealing, and in what caſes a perſon may recover his horſe. Laws relating to ſheep-ſtealing. Reward for apprehending and convicting ſuch offenders. The penalty for ſtealing linnen from the whitening grounds, and woolen cloth from the

the tenters. Malicious killing or deſtroying cattle of any kind in the night time. Malicious maiming of cattle, deſtroying plantations of trees, or throwing down incloſures. Within what time ſuch offenders muſt be proſecuted. Malicious burning in the night time, any rick or ſtack of corn, hay or grain, barns or outhouſes.

LECTURE XXXVII. Of the crime properly called ROBBERY and the penalty. Robbery on the highway. Taking in deed, and taking in law. Robbery committed by ſeveral in a gang. The obligation of the hundred to anſwer robberies committed on the highway. The caſe of a receiver of the taxes being robbed. Reward for apprehending a highwayman. Larceny committed with and without a perſon's knowledge. The care which our laws have taken of our habitations. Privileges of a dwelling houſe, as an aſylum. Malicious firing of houſes, ones own or another perſon's. Penalty of ſervants' firing houſes negligently. Stealing of goods from a dwelling houſe, or out-houſe belonging to it. Stealing from a ſhop, warehouſe, ſtable &c. Robbing a perſon in his dwelling houſe. Reward for taking and convicting a perſon felonioufly breaking into a houſe in the day time. Of Burglary. Various

caſes

caſes of it. Of piracy. Where tried. What regard is paid to the civil law in this caſe.

LECTURE XXXVIII. Of ACCESSARIES to crimes. Before and after the fact. In what caſes there can be no acceſſaries. Rules of proceeding with acceſſaries, with reſpect to the principals. Proviſion for apprehending felons by the method of hue and cry. Benefit of clergy. Origin and preſent uſe of it. General remarks concerning the crime of felony, and the puniſhment of it in England.

LECTURE XXXIX. PROPERTIES common to things real and perſonal, particularly the methods of alienation common to both. Of CONTRACTS. What will, and what will not be deemed a contract binding in law. How time is conſidered in contracts. What contracts muſt be in writing. Of conſideration in contracts. Expreſs and implied. Of ſale or exchange. At what time the property is transferred from the ſeller to the buyer in different caſes. Of earneſt, and payment. Of bailment, ſimple or conditional. The obligation of the receiver in different caſes, with the remedy for abuſe of truſt, expreſs or implied. Of Hiring and Borrowing. Remedy in caſe of the abuſe, or the loſs

of

of the thing borrowed. When the owner, and when the borrower muſt ſtand by the loſs. Of Intereſt or Uſury. The common-law with reſpect to it. Various alterations by acts of parliament. Difference between intereſt of money and a bargain. Caſe of hazard. Of Inſurance public or private. In what caſes the inſurers are anſwerable for loſſes, &c. and in what caſes they are not anſwerable. Penalty for wilfully deſtroying ſhips that are inſured.

LECTURE XL. Of Debts. Debts of record, or recogniſances. Debts upon bonds. The nature and parts of a bond. What things are eſſential to them. Joint-bonds. When the condition of a bond may be ſatisfied with the payment of money, and when not. After what time it ſhall be deemed that a bond has been diſcharged. Of the action of debt. Wager of law. Of debts upon ſimple contract. Bills of exchange. Inland bills and Foreign bills. Who are liable to pay a bill of which acceptance is refuſed. Of the proteſt of bills. How far a bill ſhall be deemed payment incaſe of a bargain or contract. Particular ſtatutes concerning bills of exchange. Forging of bills.

LECTURE

LECTURE XLI. What makes a TESTAMENT, will, &c. What neceſſary to a written will. A codicil. The regulations of the 29 of Charles II concerning written and nuncupative wills, to prevent frauds. Power of a will. Progreſs of men's power over their property in this reſpect. Who may, and who may not make a will. The appointment of an executor. Who may be executors. The number of executors. The limitations of executors. The acceptance of executorſhips. The executor de ſon tort.

LECTURE XLII. The intereſt of the executor in the goods of the deceaſed. How far he repreſents the teſtator. The reſidue of an eſtate not diſpoſed of by will. Of aſſets. The power of an executor. Of minors and married women appointed executors. Of the office and duty of an executor. Of burying the deceaſed. Of the inventory. Proving the will, and the probat of it. Bona notabilia. The order in which the debts of the deceaſed muſt be paid. Debts of equal degree. The conſequence of paying debts in a different order. Order in which legacies muſt be paid. The paſſing of an executor's account before

the

the ordinary. Overſeers of a will. Of fraud or neligence in executors.

LECTURE XLIII. Of Legacies. Who are incapable of receiving by legacy. Bequeſts of the property, or of the uſe of things. How legacies are recoverable. Executors conſenting or refuſing to pay a legacy. Aſſent expreſs or implied. Caſe of the legatee dying before the death of the teſtator, or before the time when the legacy becomes due. Reſtrictions upon mothers when they are executors to their own children. Of adminiſtration when a perſon dies inteſtate. In what manner the goods of inteſtates were diſpoſed of formerly, and its progreſs to the preſent time. Who muſt be appointed adminiſtrators, and in what order. The death of an adminiſtrator. Fees for adminiſtration. The intereſt of the adminiſtrator in the goods of the deceaſed. Caſe of ſeveral adminiſtrators. The office and duty of adminiſtration. Revoking an adminiſtration.

LECTURE XLIV. Laws relating to the commerce of the sexes. Laws concerning rapes. At what age conſent is not required. What will be preſumed to be conſent. Aiders and abetters in this crime. Forcible marriage,

or

or defilement of women who have eſtates in land. Of Buggery. Of Fornication. Formerly tolerated in this kingdom. Penalty of keeping ſtews. Power of a conſtable to prevent lewdneſs. Who will be deemed a baſtard in our laws. The civil diſadvantages of ſuch perſons. Of marriage. Polygamy. At what age marriage may be contracted, or conſented to. Who may not contract marriage. Of the marriage of minors without the conſent of parents or guardians. The late marriage-act.

LECTURE XLV. How far the huſband and wife are one perſon in law. How far her property becomes his. What conveyances he may make to her uſe. How far he is bound by her contracts. Adultery. How puniſhed in former times, and at preſent. Of divorces. A menſa et thoro, and a vinculo matrimonii, with the different cauſes and conſequences of them. Rights which accrue to the ſurvivor after the death of one of the parties, or after a divorce. Eſtates by the courteſy of England. Lands held after the poſſibility of iſſue extinct. Of the dowry of widows. Free-bench, and other particular cuſtoms. Ancient dower ad oſtium eccleſiæ. What

What may be given in dower. Dower favoured in the law. In what caſes dower is loſt.

LECTURE XLVI. Of Jointures. When made. How forfeited. The caſe of a woman with child by one man, and marrying another, &c. The legal rights of parents and children. Of guardians. Different kinds of guardians. Cuſtom of London. Buſineſs of a guardian. The mutual obligations of maſters and ſervants. Who may be compelled to ſerve. Servants departing before the time contracted for, or maſters turning them away before that time. In what caſes the act of the ſervant ſhall bind the maſter. Servants conſpiring together concerning their work or wages. Of the crime of petty-treaſon. Puniſhment of it.

LECTURE XLVII. The method of procuring the benefit of the law in caſe of injury, or THE METHOD OF PROCEEDING IN THE COURTS OF JUSTICE. Of ACTIONS criminal or civil; real, perſonal, or mixed. Particular rules relating to thoſe actions which are moſt commonly uſed. Actions at common law, as the action of treſpaſs upon the caſe, of detinue, covenant, debt, treſpaſs vi et armis, ejectment, quare impedit, waſte, replevin.

Actions

Actions of the caſe upon particular ſtatutes. Private, or popular. Privileges of the king in actions. Rules concerning penal ſtatutes. Who are incapable of bringing actions, and againſt whom actions may be brought. Actions local and tranſitory. The time within which actions muſt be brought. The ſtatute of limitations, &c.

LECTURE XLVIII. OF WRITS grounded on actions. Writs original, and judicial. Writs real, perſonal, and mixed. Of arreſt. The power of the ſheriff in taking an arreſt in different caſes. Of outlawry. The penalty. How reverſed. Of Bail. common and ſpecial. Of mainprizes. The DECLARATION. Rules concerning it

LECTURE XLIX. THE PLEADINGS. Pleas general, or ſpecial. Bad pleas. Dilatory pleas. Time of pleading. Of the iſſue. Affirmative or negative. Upon matter of law or matter of fact. Iſſues in fact general or ſpecial. Of TRIAL. By inſpection, by witneſs, by certificate. Wager of battle, and ordeal diſuſed. Wager at law. Trial by record. The method of trial by JURY. Power of the jury. Who may or who may not be jurors. Qualifications of jury-men. Penalty for not appearing. Liſts of jurors, how to be made.

made. Manner of chuſing out of them. The number ſummoned to appear at aſſizes. How twelve of theſe are choſen. Miſbehaviour of jurymen. Bribing of jurors.

LECTURE L. Of ſpecial juries. How nominated. Challenging the jury, to the array, and to the poll. Challenge peremptory, and for cauſe. Challenge for favour. Of witneſſes. Their oath. Number of them. Who may, and who may not be witneſſes in various caſes. Witneſſes refuſing to appear. Preſumptive evidence. Written evidence. Reſtrictions upon the jury till verdict be given. Verdicts general, or ſpecial. Uncertain or ambiguous. Public, or private. How verdicts may be ſet aſide. Who are embracers. Penalty.

LECTURE LI Of the JUDGMENT. Final or not final. Unduly obtained. Erroneous. In what caſes ſet aſide. Of EXECUTION. The hiſtory of perſonal execution for debt. The writ of falſe judgment. Writ of attaint. Audita querela.

LECTURE LII. PROCEEDINGS IN CRIMINAL CASES, as far as they differ from thoſe in civil caſes. The different manners of PROSECUTION. Preſentment.

or indictment, information, and appeal. Of preſentment. Grand jury. How choſen. Their buſineſs, &c. Of indictments. Different from an accuſation. Where they muſt be laid. Preciſion of indictments. Of an information. Where informations muſt be ſued. For what offences information will lie. Within what time it muſt be brought. Penalty upon informers for compounding with offenders. Privilege of the king, with reſpect to penalties in penal ſtatutes. OF APPEAL. In what caſes it may be brought. How proſecuted. By writ, and by bill. Within what time, and in what place it muſt be commenced. How this proſecution differs from any other proceedings. Conſequence of bringing a falſe appeal.

LECTURE LII. OF ARRAIGNMENT. Caſe of a priſoner ſtanding mute when arraigned. Peine forte et dure. The priſoner confeſſing the fact. Demurring. Pleading in bar. Different caſes of it. Pleading the general iſſue. Of TRIAL. Trial of a Peer. Of a commoner. Where iſſues in criminal caſes muſt be tried. A tales. What number a perſon indicted of felony or treaſon may challenge.

LECTURE LIV. Of EVIDENCE. Council for the priſoner. Of verdict in capital

capital caſes. Of conviction and attainder. Of being dead in law. Of judgment. Attainting. Attainder falſified and reverſed. Of the EXECUTION, when, where, and by whom taken. Hanging in chains, &c. Of a reprieve. Of PARDON. When it may be granted. General pardons. By act of parliament, by charter of the king granted upon ſome public occaſion. Particular pardons, granted at the time when the offence was committed. Different effects of them. In what caſes pardons are allowed. Of ſummary proceedings in courts martial.

LECTURE LV. OF the laws of England reſpecting ALIENS. Who is an alien. Antiquity of the laws againſt aliens. Effects of them. What things are requiſite to conſtitute a perſon a ſubject born. Different caſes and ſtatutes reſpecting them. Diſabilities of aliens, friends or enemies, in purchaſing, and bequeathing, in actions, in offices, in trade. Of naturalization, and denization.

LECTURE LVI. OF EQUITY. Reaſons for courts of equity, drawn from the nature of civil ſociety and of laws. Excellence of the Engliſh conſtitution in this reſpect. Difference between law and equity. Courts of equity how governed by

rules. As ſafely depended upon as rules of law. Fourteen maxims of equity explained by ſelect caſes, from Harris's treatiſe on that ſubject. Maxim the firſt. He that will have equity done to him muſt do it to the ſame perſon. 2d. He that hath committed iniquity ſhall not have equity.

LECTURE LVII. MAXIM the third. Equality is equity. 4th. It is equity that that ſhould make ſatisfaction which received the benefit. 5th. It is equity, that that ſhould have ſatisfaction which ſuſtained the loſs. 6th. Equity ſuffers not a right to be without a remedy. 7th. Equity relieves againſt accidents. 8th. Equity prevents miſchief. 9th. Equity prevents multiplied ſuits. 10th. Equity regards length of time.

LECTURE LVIII. MAXIM 11th. Equity will not ſuffer a double ſatisfaction to be taken. 12th. Equity ſuffers not advantage to be taken of a penalty or forfeiture where compenſation can be made. 13th. Equity regards not the circumſtances but the ſubſtance of the act. 14th. Where equity is equal, law muſt prevail. Appeals from the court of chancery. The methods of proceeding in the court of chancery, from the beginning to the end of a ſuit.

LECTURE

LECTURE LIX. THE inſtitutions which tend to make the Engliſh nation formidable abroad, or the proviſion againſt a time of war, containing AN ACCOUNT OF THE REGULATIONS OF HIS MAJESTIES FORCES BY LAND AND SEA, with the rank and duty of all the officers in both departments. Of the INFANTRY. A Company. A Captain. A Lieutenant. An Enſign. A Serjeant. A Corporal. A Drummer. A Landpeſade. A Battalion. Grenadiers. A Regiment. A Colonel. A Lieutenant-colonel. A Major. An Adjutant. A Brigade. A Brigadier. A Brigade-Major.

LECTURE LX. AN Army. The General. The Lieutenant-general. A Major-general. Commiſſioners. The Muſter-maſter. Commiſſary of the ſtores, of the horſes, and of proviſions. Of the CAVALRY. A Troop. A Squadron. A Regiment. A Brigade. The general of the Artillery. A Gunner. A Matroſs. The maſter-gunner. The maſter general of the ordnance. The regiment of artillery. The Paymaſter-general of the land forces.

LECTURE LXI. OF the Britiſh NAVY. An Admiral. A Vice-admiral. A Rear-admiral. A Captain. A Lieutenant. A Midſhipman. The Gunners, Marines.

A Corporal. The Cockſwain. The maſter of the ſhip. The Boatſwain. The Quarter-maſter. The office of High-admiral. The navy-office. The treaſurer. Comptroller. Surveyor. Clerk of the acts. Commiſſioners of the navy. Commiſſioners for victualling the navy, for the tranſport ſervice, to take care of wounded ſeamen, and to direct the exchange of priſoners. The king's-guards, with their officers. The court of admiralty, and the admiralty-ſeſſions. The court by commiſſion according to ſtatute of Henry VIII.

LECTURE LXII. Of the national militia. Ancient ſtate of the militia. The late acts relating to it, and its preſent ſtate.

LECTURE LXIII. The manner in which the expences of government are defrayed. The ſtate of the Engliſh revenue in ancient times. At the revolution, and at preſent. Taxes. Cuſtoms. Exciſe. The officers employed in collecting and receiving them. Funds. &c.

LECTURE LXIV. The ecclesiastical state of the kingdom. *This part of the courſe not being yet compoſed, it is not known how many lectures it may require; it is only conjectured, that about half a dozen may be ſufficent,*

REMARKS

REMARKS

ON A PROPOSED

CODE of EDUCATION.

REMARKS

ON A PROPOSED

CODE OF EDUCATION.

SINCE the writing of the preceding Eſſay, I find the interference of the civil magiſtrate in the buſineſs of education ſtrongly recommended, and the want of it in our own country complained of, in a treatiſe intitled, *Thoughts on civil liberty licentiouſneſs and faction*, written by Dr. Brown; who has alſo more fully explained his meaning, in *An Appendix relative to a propoſed Code of Education*, ſubjoined to *A Sermon*

Sermon on the female Character and Education. As the object for which this writer contends would render all private ſchemes for the improvement of education ineffectual; and conſequently, fruſtrate all my labours, as well as thoſe of many others, in this field, which is, at preſent, common to all who are diſpoſed to labour in it, he cannot take it amiſs, that I examine the excluſive claim of the civil magiſtrate, and endeavour to diſprove the right which he aſcribes to him in this caſe.

LEST it ſhould be apprehended, that I miſtake the views of this writer, I ſhall ſubjoin a few extracts from the work, which contain the ſubſtance of what he has advanced on the ſubject of education. He aſſerts, "That, the firſt and beſt ſecurity "of civil liberty conſiſts, in impreſſing the "infant mind with ſuch habits of thought "and action, as may correſpond with, and "promote the appointments of public law." In his appendix, he ſays, that, "by a "CODE OF EDUCATION he means a ſyſtem "of principles, religious, moral, and po- "litical, whoſe tendency may be the pre- "ſervation of the bleſſings of ſociety, as "they are enjoyed in a free ſtate, to be in- "ſtilled effectually into the infant and "growing

"growing minds of the community, for "this great end of public happineſs.

In what manner this ſecurity of civil liberty is to be effected by means of this Code of Education, may be ſeen in the following deſcription he gives of the inſtitutions of Sparta. "No father had a right "to educate his children according to the "caprice of his own fancy. They were "delivered to public officers, who initiated "them early in the manners, the maxims, "the exerciſes, the toils; in a word, in all "the mental and bodily acquirements and "habits which correſponded with the genius "of the ſtate. Family connections had no "place. The firſt and leading object of "their affection was the general welfare. "This tuition was carefully continued till "they were enrolled in the liſt of men.

With reſpect to the Athenian government, he ſays, page 62, "The firſt and "ruling defect in the inſtitution of this re-"public ſeems to have been the total want "of an eſtabliſhed education, ſuitable to "the genius of the ſtate. There appears "not to have been any public, regular, or "preſcribed appointment of this kind, be-"yond what cuſtom had accidentally intro-"duced."

He

He ſays, page 70, "There were three "fatal circumſtances admitted into the very "eſſence of the Roman republic, which "contained the ſeeds of certain ruin; the "firſt of which was, the neglect of inſti-"tuting public laws, by which the educa-"tion of their children might have been "aſcertained."

He complains, page 83, "that the "Britiſh ſyſtem of policy and religion is "not upheld in its native power like that "of Sparta, by correſpondent and effectual "rules of education; that it is in the "power of every private man to educate "his child, not only without a reverence "for theſe, but in abſolute contempt of "them; that, at the Revolution, page 90, "the education of youth was ſtill left in "an imperfect ſtate; this great revolution "having confined itſelf to the reform of "public inſtitutions, without aſcending to "the great fountain of political ſecurity, "the private and effectual formation of "of the infant mind; and, page 107, that "education was afterwards left ſtill more "and more imperfect."

Lastly, he aſſerts, page 156, "that "the chief and eſſential remedy of licenti-"ouſneſs and faction, the fundamental "means of the laſting and ſecure eſtabliſh-

"ment

"ment of civil liberty, can only be in "a general and prescribed improvement "of the laws of education, to which all "the members of the community should "legally submit; and that for want of "a prescribed code of education, the "manners and principles, on which "alone the state can rest, are ineffectually instilled, are vague, fluctuating and self contradictory. Nothing," he says, "is more evident, than "that some reform in this great point is "necessary for the security of public free-"dom, and that though it is an incurable "defect of our political state, that it has "not a correspondent and adequate code "of education inwrought into its first "essence; we may yet hope, that, in a "secondary and inferior degree, some-"thing of this kind may still be inlaid; "that, though it cannot have that perfect "efficacy as if it had been originally of "the piece, yet, if well conducted, it "may strengthen the weak parts, and al-"leviate defects, if not completely remove "them."

In conducting my examination of these sentiments, I shall make no remarks upon any particular passages in the book, but consider only the author's general scheme, and the proper and professed object of it.

As

As the Dr. has propoſed no particular plan of public education, I ſhall be as general as he has been, and only ſhew the inconvenience of eſtabliſhing, by law, any plan of education whatever.

THIS writer pleads for a plan of education eſtabliſhed by the legiſlature, as the only effectual method of preventing faction in the ſtate, and ſecuring the perpetuity of our excellent conſtitution, eccleſiaſtical and civil. I agree with him, in acknowleging the importance of education, as influencing the manners and the conduct of men; and that reaſon without inſtruction is a blind, and ſometimes a dangerous principle. I alſo acknowledge, that an uniform plan of education, agreeable to the principles of any particular form of government, civil or eccleſiaſtical, would tend to eſtabliſh and perpetuate that form of government, and prevent civil diſſentions and factions in the ſtate. But I ſhould object to the interference of the legiſlature in this buſineſs of education, as prejudicial to the proper deſign of education, and alſo to the great ends of civil ſocieties with reſpect to their preſent utility; but more eſpecially, as tending to interrupt their progreſs to a ſtate of greater perfection than they have yet attained to. I ſhall moreover

moreover ſhow, that it would be abſolutely inconſiſtent with the true principles of the Engliſh government, and could not be carried into execution, to any purpoſe, without the ruin of our preſent conſtitution. I beg the candour of this writer and that of the public, while I endeavour to explain, in as few words as poſſible, in what manner, I apprehend, this interference of the civil magiſtrate would operate to obſtruct theſe great ends. I ſhall conſider theſe four articles in four diſtinct ſections.

SECTION I.

I OBSERVED in the firſt place, that I apprehended a legal code of education might interfere with the proper deſign of education itſelf. I do not mean what this writer, ſeems to conſider as the only object of education, the tranquility of the ſtate; but the forming of wiſe and virtuous men; which is certainly an object of the greateſt importance in every ſtate. If the conſtitution of a ſtate be a good one, ſuch men will be the greateſt bulwarks of it; if it be a bad one, they will be the moſt able and

and ready to contribute to its reformation; in either of which caſes they will render it the greateſt ſervice.

EDUCATION is as much an art (founded, as all arts are, upon ſcience) as huſbandry, as architecture, or as ſhip-building. In all theſe caſes we have a practical problem propoſed to us, which muſt be performed by the help of data with which experience and obſervation furniſh us. The end of ſhip-building is to make the beſt ſhips, of architecture the beſt houſes, and of education, the beſt men. Now, of all arts, thoſe ſtand the faireſt chance of being brought to perfection, in which there is opportunity of making the moſt experiments and trials, and in which there are the greateſt number and variety of perſons employed in making them. Hiſtory and experience ſhow, that, cæteris paribus, thoſe arts have always, in fact, been brought the ſooneſt, or the neareſt to perfection, which have been placed in thoſe favourable circumſtances. The reaſon is, that the operations of the human mind are ſlow, a number of falſe hypotheſes and concluſions always lead to the right one; and in every art, manual or liberal, a number of awkward attempts are made, before we are able to execute any thing which will

will bear to be ſhown as a maſter-piece in the art; ſo that to eſtabliſh the methods and proceſſes of any art, before it have arrived to a ſtate of perfection (of which no man can be a judge) is to fix it in its infancy, to perpetuate every thing that is inconvenient and awkward adhering to it, and to cut off its future growth and improvement. And to eſtabliſh the methods and proceſſes of any art when it has arrived to perfection is ſuperfluous. It will then recommend and eſtabliſh itſelf.

Now I appeal to this writer himſelf, whether any plan of education, which has yet been put in execution in this kingdom, be ſo perfect, as that the eſtabliſhing of it by authority would not obſtruct the great ends of education; or even whether the united genius of man could, at preſent, form ſo perfect a plan. Every man who is experienced in the buſineſs of education well knows, that the art is in its infancy; but advancing, it is hoped, apace to a ſtate of manhood. In this condition, it requires the aid of every circumſtance favourable to its natural growth, and dreads nothing ſo much as being confined and cramped by the unſeaſonable kind of power. To put, it (in its preſent imperfect ſtate) into the hands of the civil magiſtrate, in order to

fix the mode of it, would be like fixing the the dreſs of a child, and forbidding its cloaths ever to be made wider or larger.

MANUFACTURERS, and artiſts of ſeveral kinds already complain of the obſtruction which is given to their arts, by the injudicious acts of former Parliaments; and it is the object of our wiſeſt ſtateſmen to get theſe obſtructions removed, by the repeal of thoſe acts. I wiſh it could not be ſaid, that the buſineſs of education is already under too many legal reſtraints. Would to God theſe were removed, and a few more fair experiments made of the different methods of conducting it, before the legiſlature thought proper to interfere any more with it, and by that time, it is hoped, they would ſee no reaſon to interfere at all. The buſineſs would be conducted to much better purpoſe, even in favour of their own views, if thoſe views were juſt and honourable, than it would be under any arbitrary regulations whatever.

To ſhew this ſcheme of an eſtabliſhed method of education in a clearer point of light, let us imagine that what is now propoſed had been carried into execution ſome centuries ago. For no reaſon can be aſſigned for fixing any mode of education at preſent,

preſent, which might not have been made uſe of, with the ſame appearance of reaſon, for fixing another approved method a thouſand years ago. Suppoſe Alfred, when he founded the Univerſity of Oxford, had made it impoſſible, that the method of inſtruction uſed in his time ſhould ever have been altered. Excellent as that method might have been, for the time in which it was inſtituted, it would now have been the worſt method that is practiſed in the world. Suppoſe the number of the arts and ſciences, with the manner of teaching them, had been fixed in this kingdom, before the revival of letters and of the arts, it is plain they could never have arrived at their preſent advanced ſtate among us. We ſhould not have had the honour to lead the way in the moſt noble diſcoveries, in the Mathematics, Philoſophy, Aſtronomy, and I may add Divinity too. And for the ſame reaſon, were ſuch an eſtabliſhment to take place in the preſent age, it would prevent all great improvements in futurity.

I MAY add, in this place, that, arguing from the analogy of education to other arts which are moſt ſimilar to it, we can never expect to ſee human nature, about which it is employed, brought to perfection, but in conſequence of indulging

unbounded liberty, and even caprice in conducting it. The power of nature in producing plants cannot be ſhown to advantage, but in all poſſible circumſtances of culture. The richeſt colours, the moſt fragrant ſcents, and the moſt exquiſite flavours, which our preſent gardens and orchards exhibit, would never have been known, if floriſts and gardeners had been confined in the proceſſes of cultivation; nay if they had not been allowed the utmoſt licentiouſneſs of fancy in the exerciſe of their arts. Many of the fineſt productions of modern gardening have been the reſult of caſual experiment, perhaps of undeſigned deviation from eſtabliſhed rules. Obſervations of a ſimilar nature may be made on the methods of breeding cattle, and training animals of all kinds. And why ſhould the rational part of the creation be deprived of that opportunity of diverſifying and improving itſelf, which the vegetable and animal world enjoy?

FROM new, and ſeemingly irregular methods of education, perhaps ſomething extraordinary and uncommonly great may ſpring, at leaſt there would be a fair chance for ſuch productions; and if ſomething odd and excentric ſhould, now and then, ariſe from this unbounded liberty of education,

education, the various buſineſs of human life may afford proper ſpheres for ſuch excentric geniuſes.

EDUCATION, taken in its moſt extenſive ſenſe, is properly that which makes the man. One method of education, therefore, would only produce one kind of men; but the great excellence of human nature conſiſts in the variety of which it is capable. Inſtead than of endeavouring, by uniform and fixed ſyſtems of education, to keep mankind always the ſame, let us give free ſcope to every thing which may bid fair for introducing more variety among us. The various character of the Athenians was certainly preferable to the uniform character of the Spartans, or to any uniform natural character whatever.

Is it not univerſally conſidered as an advantage to England, that it contains ſo great a variety of original characters? And is it not, on this account, preferred to France, Spain, or Italy?

UNIFORMITY is the characteriſtic of the brute creation. Among them every ſpecies of birds build their neſts with the ſame materials, and in the ſame form; the genius and diſpoſition of one individual is that of all, and it is only the education which men give them that raiſes any of

them much above others. But it is the glory of human nature, that the operations of reaſon, though variable, and by no means infallible, are capable of infinite improvement. We come into the world worſe provided than any of the brutes, and for a year or two of our lives, many of them go far beyond us in intellectual accompliſhments, and would go much farther beyond us, if they were upon a level with us in point of education. But when their faculties are at a full ſtand, and their enjoyments incapable of variety, or increaſe, our intellectual powers are growing apace; we are perpetually deriving happineſs from new ſources, and even before we leave this world are capable of taſting the felicity of angels.

HAVE we then ſo little ſenſe of the proper excellence of our natures, and of the views of divine providence in our formation, as to catch at a poor advantage adapted to the lower nature of brutes. Rather, let us hold on in the courſe in which the Divine Being himſelf has put us, by giving reaſon its full play, and throwing off the fetters which ſhort-ſighted and ill-judging men have hung upon it. Though, in this courſe, we be liable to more extra-

vagancies

vagancies than brutes, governed by blind but unerring inſtinct, or than men whom miſtaken ſyſtems of policy have made as uniform in their ſentiments and conduct as the brutes, we ſhall be in a way to a pitch of perfection and happineſs of which they can have no idea.

As men are firſt animals before they can be properly termed rational creatures, and the analogies of individuals extend to ſocieties, a principle ſomething reſembling the inſtinct of animals may, perhaps, ſuit mankind in their infant ſtate, but then, as we advance in the arts of life, let us, as far as we are able, aſſert the native freedom of our ſouls, and, after having been ſervilly governed like brutes, aſpire to the noble privilege of governing ourſelves like men.

If it may have been neceſſary to eſtabliſh ſomething by law concerning education, that neceſſity grows leſs every day, and encourages us to relax the bonds of authority, rather than bind them faſter.

SECTION

SECTION II.

SECONDLY, this ſcheme of an eſtabliſhed mode of education would be prejudicial to the great ends of civil ſociety. The great object of civil ſociety is the happineſs of the members of it, in the perfect and undiſturbed enjoyment of the more important of our natural rights, for the ſake of which, we voluntarily give up others of leſs conſequence to us. But whatever be the bleſſings of civil ſociety, they may be bought too dear. It is certainly poſſible to ſacrifice too much, at leaſt more than is neceſſary to be ſacrificed for them, in order to produce the greateſt ſum of happineſs in the community. Elſe why do we complain of tyrannical and oppreſſive governments? Is it not the meaning of all complaints of this kind, that, in ſuch governments, the ſubjects are deprived of their moſt important natural rights, without an equivalent recompence; that all the valuable ends of civil government might be effectually ſecured, and the members of

of particular ſtates be much happier upon the whole, if they did not lie under thoſe reſtrictions.

Now, of all the ſources of happineſs and enjoyment in human life, the domeſtic relations are the moſt conſtant and copious. With our wives and children we neceſſarily paſs the greateſt part of our lives. The connections of friendſhip are ſlight in compariſon of this intimate domeſtic union. Views of intereſt or ambition may divide the neareſt friends, but our wives and children are, in general, inſeparably connected with us: and attached to us, with them all our joys are doubled, and in their affection and aſſiduity we find conſolation under all the troubles and diſquietudes of life. For the enjoyments which reſult from this moſt delightful intercourſe, all mankind, in all ages, have been ready to ſacrifice every thing; and for the interruption of this intercourſe no compenſation whatever can be made by man. What then can be more juſtly alarming to a man who has a true taſte for happineſs, than, either that the choice of his wife, or the education of his children ſhould be under the direction of perſons who had no particular knowledge of him, or particular affection for him, and whoſe views and maxims

maxims he might utterly diſlike? What proſpect of happineſs could a man have with ſuch a wife, or ſuch children?

It is poſſible, indeed, that the preſervation of ſome civil ſocieties, ſuch as that of Sparta, may require this ſacrifice; but that civil ſociety muſt be wretchedly conſtituted to ſtand in need of it, and had better be utterly diſſolved. Were I as member of ſuch a ſtate, thankful ſhould I be to its governors, if they would permit me peaceably to retire to any other country, where ſo great a ſacrifice was not required. Indeed it is hardly poſſible that a ſtate ſhould require another which I ſhould think of ſo much importance. And, I doubt not, ſo many others would be of the ſame mind, that there would ſoon be very little reaſon to complain of the too great increaſe of commerce in ſuch a country. This, however, would render very neceſſary another part of our author's ſcheme; viz. putting a reſtraint upon travelling abroad, leſt too many ſhould be willing to leave ſuch a country, and have no inclination to return to it.

If there be any natural rights which ought not to be ſacrificed to the ends of civil ſociety, and no politicians or moraliſts deny

deny but that there are ſome (the obligations of religion, for inſtance, being certainly of a ſuperior nature) it is even more natural to look for thoſe rights among thoſe which reſpect a man's children, than among thoſe which reſpect himſelf; becauſe nature has generally made them dearer to him than himſelf.

If any truſt can be ſaid to be of God, and ſuch as ought not to be relinquiſhed at the command of man, it is that which we have of the education of our children, which the Divine Being ſeems to have put under our immediate care, that we may inſtruct them in ſuch principles, form them to ſuch manners, and give them ſuch habits of thinking and acting, as we ſhall judge to be of the greateſt importance to their preſent and future well being.

I believe there is no father in the world, who, to a ſenſe of religion, joins a ſtrong ſenſe of parental affection, who would think his own liberty above half indulged to him, when abridged in ſo tender a point, as that of providing, to his own ſatisfaction, for the good conduct and happineſs of his offspring. Nature ſeems to have eſtabliſhed ſuch a ſtrong connection between a parent and his children, at leaſt during the firſt period of their lives, that

to

to drag them from the aſylum of their natural guardians, to force them to public places of education, and to inſtill into them religious ſentiments contrary to their parents' judgment and choice, would be as cruel, as obliging him to make the greateſt perſonal ſacrifice, even that of his conſcience, to the civil magiſtrate.

WHAT part of the perſecution which the proteſtants in France underwent did they complain of more feelingly, and with more juſtice, than that of their children being forced from them, and carried to be educated in public monaſteries? God forbid that the parental affection of free born Britons ſhould ever be put to ſo ſevere a trial! or as that which the poor Jews in Portugal ſuffered, many of whom cut the throats of their children, or threw them into wells, and down precipices, rather than ſuffer them to be dragged from them, to be educated under the direction of a popiſh inquiſition, thinking the lives of their children a leſs ſacrifice than that of their principles.

I HAVE not the leaſt perſonal knowledge of Dr. Brown; I do not even know whether he have a wife or children; but

but I ſhould wonder if any married man, who is tolerably happy in that ſtate, could be an advocate for ſuch a ſcheme.

It was a meaſure ſimilar to this which Dr. Brown recommends, at which the whole chriſtian world took the greateſt alarm that was ever given to it, in the reign of that great man, but inveterate enemy of chriſtianity, the emperor Julian; who would have ſhut up the ſchools of Chriſtians, and have forbidden them to teach Rhetoric and Philoſophy. Similar to this ſcheme, in its nature and tendency was the moſt odious meaſure of the moſt odious miniſtry which ever ſet at the helm of the Britiſh government, and which was providentially defeated the very day that it was to have been carried into execution, I mean the SCHISM BILL, patronized by the Tory miniſters in the latter end of the reign of queen Ann. Should theſe meaſures be reſumed, and purſued, Farewell, a long farewell to England's greatneſs! Nor would this be ſaid in a haſty fit of unreaſonable deſpair. For, beſides that ſuch a meaſure as this could not but have many extenſive conſequences; it is not to be doubted, but that whoever they be who do thus much, they both would, and could

could do more. Such a ſcheme as this will never be puſhed for its own ſake only.

In examining the preſent operation and utility of any ſcheme of policy, we ought to take into conſideration the eaſe or the difficulty of carrying it into execution. For if the diſturbance which would be occaſioned by bringing it into execution would be ſo great an inconvenience, as to overballance the good to be effected by it, it were better never to atempt it. Now, though the Doctor have laid down no particular ſcheme of public and eſtabliſhed education, and therefore we cannot judge of the particular difficulties which would attend the eſtabliſhing of it; yet, if it be ſuch as would anſwer the end propoſed by him, this difficulty would appear to me abſolutely inſuperable, in ſuch a country as England.

Whatever be the *religious, moral, and political principles* which are thought conducive to the good of the ſociety, if they muſt be *effectually inſtilled into the infant and growing minds of the community*, it can never be done without taking the children very early from their parents, and cutting off all communication with them, till they be arrived to maturity, and their judgments be

be abſolutely fixed. And if this author judged, that the reaſon why a ſcheme of this nature did not take place in Athens, was the difficulty of eſtabliſhing it, after the people were tolerably civilized; he muſt certainly judge it to be infinitely more difficult, among a people ſo much farther advanced in the arts of life than the Athenians.

He will obſerves, page 53 that, "to give "children a public education where no "education had taken place, was natural "and practicable"; but he ſeems to be well aware, that an attempt to carry any ſuch a plan into execution, in the moſt flouriſhing period of a free and civilized ſtate, would be highly unnatural, without the leaſt probable hope of ſucceſs, and dangerous to ſuch as took it in hand. For he ſays, page 52, that, "to effect a change "of government only is a work ſufficient "for the abilities of the greateſt Legiſla-"tor; but to overturn all the preeſta-"bliſhed habits of the head and heart, to "deſtroy or reverſe all the fixed aſſociati-"ons, maxims, manners, and principles, "were a labour which might well be rank-"ed among the moſt extravagant legends "of fabulous Greece."

SECTION

SECTION III.

IN the third place, I would obſerve, that an eſtabliſhed code of education, ſuch as this writer contends for, allowing its tendency to perpetuate the preſent conſtitution of this country in church and ſtate, tends to interrupt its progreſs to a ſtate of greater perfection than it has yet attained to.

I CAN heartily join with Dr. Brown, or any perſon, in their encomiums on the Britiſh conſtitution, when it is compared with that of any other country in the world. I really think it to be the beſt actual ſcheme of civil policy; but if any perſon ſay that it is perfect, and that no alteration can be made in it for the better, I beg leave to withold my aſſent. Dr. Brown himſelf does not heſitate to acknowledge, that there are imperfections in it. How then can a real friend to his country wiſh

wiſh to fix its imperfections upon it, and make them perpetual? I ſhould object to a ſyſtem of education, the beſt poſſible in every other reſpect, if it had ſo unfavourable an aſpect.

It will be ſaid, that alterations may, indeed, be made, but cannot be made with ſafety, and without the danger of throwing every thing into confuſion; ſo that, upon the whole, things had better remain as they are: but, allowing this, for the preſent, why ſhould they be perpetuated as they are? If the propoſed alterations were violent ones, that is, introduced by violent meaſures, they might juſtly give alarm to all good citizens. I would endeavour to ſtop the ableſt hand that ſhould attempt to reform in this manner; becauſe it is hardly poſſible but that a remedy ſo effected muſt be worſe than the diſeaſe. But ſtill, why ſhould we object to any ſtate's gradually reforming itſelf, or throw obſtacles in the way of ſuch reformations?

All civil ſocieties, and the whole ſcience of civil government on which they are founded, are yet in their infancy. Like other arts and ſciences, they are gradually improving, but they improve more ſlowly; becauſe opportunities for making experiments are fewer. Indeed,

hardly any trials in legiſlation have ever been made by perſons who had knowledge and ability to collect from hiſtory, and to compare, the obſervations which might be of uſe for this purpoſe, or had leiſure to digeſt them properly at the time. Taking it for granted, therefore, that our conſtitution and laws have not eſcaped the imperfections which we ſee to be incident to every thing human; by all means, let the cloſeſt attention be given to them, let their excellencies and defects be thoroughly laid open, and let improvements of every kind be made; but not ſuch as would prevent all further improvements: becauſe it is not probable, that any improvements, which the utmoſt ſagacity of man could now ſuggeſt, would be an equivalent for the prevention of all that might be made hereafter. Were the beſt formed ſtate in the world to be fixed in its preſent condition, I make no doubt but that, in a courſe of time, it would be the very worſt.

HISTORY demonſtrates this truth with reſpect to all the celebrated ſtates of antiquity; and as all things, and particularly whatever depends upon ſcience, has of late years been in a quicker progreſs towards perfection than ever; we may ſafely conclude the ſame with reſpect to any politi-

cal

cal ſtate now in being. What advantage did Sparta (the conſtitution of whoſe government was ſo much admired by the ancients, as is the method of giving permanency to it by Dr. Brown) reap from thoſe inſtitutions which contributed to its longevity, but the longer continuance of, what I ſhould not ſcruple to call, the worſt government we read of in the world; a government which ſecured to a man the feweſt of his natural rights, and of which a man who had a taſte for life would leaſt of all chuſe to be a member. While the arts of life were improving in all the neighbouring nations, Sparta derived this noble prerogative from her conſtitution, that ſhe continued the neareſt to her priſtine barbarity; and in the ſpace of near a thouſand years (which include the whole period in which letters and the arts were the moſt cultivated in the reſt of Greece) produced no one poet, orator, hiſtorian, or artiſt of any kind. The convulſions of Athens, where life was in ſome meaſure enjoyed, and the faculties of body and mind had their proper exerciſe and gratification, were with me, far preferable to the ſavage uniformity of Sparta.

THE conſtitution of Egypt was ſimilar to that of Sparta, and the advantages this country received from it were ſimilar. Egypt was the mother of the arts to the ſtates of Greece; but the rigid inſtitutions of this mother of the arts kept them in their infancy; ſo that the ſtates of Greece, being more favourably ſituated for improvements of all kinds, ſoon went beyond their inſtructreſs; while no improvements of any kind were ever made in Egypt, till it was ſubdued by a foreign power. What would have been the ſtate of agriculture, ſhipbuilding, or war, if thoſe arts had been fixed in England two or three centuries ago?

DR. Brown will urge me with the authority of Plutarch, who largely extols the regulations of Egypt and of Sparta, and cenſures the Roman legiſlators for adopting nothing ſimilar to them. But I beg leave to appeal from the authority of Plutarch, and of all the ancients, as by no means competent judges in this caſe. Imperfect as the ſcience of government is at preſent, it is certainly much more perfect than it was in their time; elſe, the world has grown ſo much older to little purpoſe. On the authority of the ancients, Dr. Brown might as

as well contend for another inſtitution of the famed Egyptians; viz. their obliging all perſons to follow the occupations of their fathers, and perhaps this might be no bad auxiliary to his preſcribed mode of education, and prevent the ſpringing up of faction in a ſtate. It would likewiſe favour another object which the Dr. has profeſſedly in view, viz. checking the growth of commerce.

SUPPOSING this wiſe ſyſtem of perpetuation had occurred to our anceſtors in the feudal times, and that an aſſembly of old Engliſh Barons, with their heads full of their feudal rights and ſervices, had imitated the wiſe Spartans, and perpetuated the ſevere feudal inſtitutions; what would England at this day have been (with the unrivalled reputation of uniformity and conſtancy in its laws) but the moſt barbarous, the weakeſt, and moſt diſtracted ſtate in Europe? It is plain from fact, that divine providence had greater things in view in favour of theſe kingdoms, and has been conducting them through a ſeries of gradual changes, (ariſing from internal and external cauſes) which have brought us to our preſent happy condition, and which, if ſuffered to go on, will probably carry us

to a pitch of happineſs of which we can yet form no conception.

HAD the religious ſyſtem of our oldeſt forefathers been eſtabliſhed on theſe wiſe and perpetual foundations, we had now been Pagans, and our prieſts Druids. Had our Saxon conquerors been endowed with the ſame wiſdom and foreſight, we had been worſhipping Thor, and Woden; and had our anceſtors three centuries ago catched this ſpirit, we had been blind and prieſt-ridden Papiſts. The greateſt bleſſing that can befall a ſtate, which is ſo rigid and inflexible in its inſtitutions, is to be conquered by a people who have a better government, and have made farther advances in the arts of life than itſelf. And it is undoubtedly a great advantage which the Divine Being has provided for this world of ours, that conqueſts and revolutions ſhould give mankind an opportunity of reforming their ſyſtems of government, and of improving the ſcience of it, which they would never have found themſelves.

IN the excellent conſtitution of nature, evils of all kinds will, ſome way or other, find their proper remedy; and when government, religion, education, and every thing that is valuable in ſociety ſeems to be

be in ſo fine a progreſs towards a more perfect ſtate, is it not our wiſdom to favour this progreſs? and to allow the remedies of all diſorders to operate gradually and eaſily, rather than, by a violent ſyſtem of perpetuation, to retain all diſorders till they force a remedy. In the excellent conſtitution of the human body we ſee a variety of outlets provided for noxious humors, by means of which the ſyſtem relieves itſelf when any ſlight diſorders happen to it. But we ſee that, if theſe outlets be obſtructed, the whole ſyſtem is endangered by the convulſions which enſue.

SOME things in civil ſociety do, in their own nature, require to be eſtabliſhed, or fixed by law for a conſiderable time; but that part of the ſyſtem is ſure, for the reaſons mentioned above, to be the moſt imperfect; and therefore it is the wiſdom of the legiſlature to make that part as ſmall as poſſible, and to let the eſtabliſhments which are neceſſary be as eaſy as is conſiſtent with the tolerable order of ſociety. It is an univerſal maxim, that the more liberty is given to every thing which is in a ſtate of growth the more perfect it will become, and when it is grown to its full ſize, the more amply will it repay its wiſe parent for the indulgence it gave it in its

infant ſtate. A judicious father will bear with the frowardneſs of his children, and overlook many ſlights of youth which can give him no pleaſure, but from the proſpect they afford of his children becoming uſeful and valuable men, when the fire of youth is a little abated.

I do not pretend to define what degree of eſtabliſhment is neceſſary for religion, or for many other articles in civil ſociety: But I think it is very clear that education requires none. And thus much I think is alſo clear, that every ſyſtem of policy is too ſtrict and violent, in which any thing, that may be the inſtrument of general happineſs, is under ſo much reſtraint, that it can never reform itſelf from the diſorders which may be incident to it; when it is ſo circumſtanced, that it cannot improve as far as it is capable of improvement, but that every reformation muſt neceſſarily be introduced from ſome other quarter; in which caſe it muſt generally be brought about by force. Is it not a ſtanding argument that religion, in particular, has been too much confined in all countries, that the body of the clergy have never been able to reform themſelves, and that all reformations have ever been forced upon them, and have generally been attended with

with the moſt horrible perſecutions, and dangerous convulſions in the ſtate? I cannot help thinking alſo, that every ſyſtem of government is violent and tyrannical, which incapacitates men of the beſt abilities, and of the greateſt integrity from rendering their country any ſervice in their power, while thoſe who pay no regard to conſcience may have free acceſs to all places of power and profit.

It ſeems to be the uniform intention of divine providence to lead mankind to happineſs in a progreſſive, which is the ſureſt, though the ſloweſt method. Evil is ever made to lead to good, and imperfect to perfect. The Divine Being might, no doubt, have adopted a different plan, have made human nature and human governments perfect from the beginning. He might have formed the human mind with an intuitive knowledge of truth, without leading men through ſo many labyrinths of error. He might have made man perfectly virtuous, without giving ſo much exerciſe to his paſſions in his ſtruggles with the habits of vice. He might have ſent an angel, or have commiſſioned a man to eſtabliſh a perfect form of civil government; and, a priori, this would ſeem to have been almoſt

as eſſential to human happineſs as any ſyſtem of truth; at leaſt, that it would have been a valuable addition to a ſyſtem of religious truth, but though it would be impiety in us to pretend to fathom the depths of the divine councils, I think we may fairly conclude, that if this method of proceeding had been the beſt for us, he, whom we cannot conceive to be influenced by any thing but his deſire to promote the happineſs of his creatures, would have purſued it. But a contrary method has been adopted in every thing relating to us.

How many falls does a child get before it learns to walk ſecure. How many inarticulate ſounds precede thoſe which are articulate. How often are we impoſed upon by all our ſenſes before we learn to form a right judgment of the proper objects of them. How often do our paſſions miſlead us, and involve us in difficulties, before we reap the advantage they were entended to bring us in our purſuit of happineſs; and how many falſe judgments do we make, in the inveſtigation of all kinds of truth, before we come to a right concluſion. How many ages do errors and prejudices of all kinds prevail before they are diſſipated to the light of truth, and how general

general and how long was the reign of falſe religion before the propagation of the true? How late was chriſtianity, that great remedy of vice, and ignorance introduced. How ſlow and how confined its progreſs!

In ſhort, it ſeems to have been the intention of divine providence, that mankind ſhould be, as far as poſſible, ſelf taught; that we ſhould attain to every thing excellent and uſeful as the reſult of our own experience and obſervation; that our judgments ſhould be formed by the appearances which are preſented to them, and our hearts inſtructed by their own feelings. But by the unnatural ſyſtem of rigid unalterable eſtabliſhments, we put it out of our power to inſtruct ourſelves, or to derive any advantage from the lights we acquire from experience and obſervation; and thereby, as far as is in our power, we counteract the kind intentions of the deity in the conſtitution of the world, and in providing for a ſtate of conſtant, though ſlow improvement in every thing.

A variety of uſeful leſſons may be learned from our attention to the conduct of divine providence reſpecting us. When hiſtory and experience demonſtrate the uniform method of divine providence to have

have been what has been above repreſented, let us learn from it to be content with the natural, though ſlow progreſs we are in to a more perfect ſtate. But let us always endeavour to keep things in this progreſs. Let us, however, beware leſt by attempting to accelerate, we in fact, retard our progreſs in happineſs. But more eſpecially, let us take heed, leſt, by indeavouring to ſecure and perpetuate the great ends of ſociety, we, in fact defeat thoſe ends. We ſhall have a thouſand times more enjoyment of a happy and perfect form of government, when we can ſee in hiſtory the long progreſs of our conſtitution through barbarous and imperfect ſyſtems of policy, as we are more confirmed in the truth, and have more enjoyment of it, by reviewing the many errors by which we were miſled in our purſuit of it. If the Divine Being ſaw that the beſt form of government, that even he could have preſcribed for us, would not have anſwered the end of its inſtitution, if it had been impoſed by himſelf; much leſs can we imagine it could anſwer any valuable purpoſe, to have the crude ſyſtems (for they can be nothing more) of ſhort-ſighted men for ever impoſed upon us.

In more reſpects than one, doth this writer propoſe to raiſe the terms on which we are to live in ſociety; ſo that, under his adminiſtration, a man could enjoy little more than bare ſecurity in the poſſeſſion of his property, and that upon very hard terms. The care he would take to ſhackle men's minds, in the firſt formation of their thinking powers, and to check their exertions when they were formed, would, I apprehend, put an effectual ſtop to all the noble improvements of which ſociety is capable. Knowledge, particularly of the more ſublime kinds, in the ſciences of Morals and Religion, could expect no encouragement. He would have more reſtrictions laid upon the publication of books, he complains page 103 that, in the late reign, deiſtical publications proceeded almoſt without cogniſance from the civil magiſtrate, and aſſerts, appendix page 29, that there are many opinions or principles tending evidently to the deſtruction of ſociety or freedom, and which, therefore, ought not to be tolerated in a well ordered free community.

The civil magiſtrate then, according to this writer, ought to controll the preſs, and therefore prevent, by means of effectual penalties (or elſe he doth nothing) the

the publication of any thing, that might directly or indirectly, thwart his views of civil policy, which, in England, comprehends the preſent form of our eſtabliſhed religion. But ſo extenſive is the connection of all kinds of truth, that if a man would keep effectually clear of the ſubject of religion, he muſt not indulge a free range of thought near the confines of it. The ſubjects of metaphyſics, morals, and natural religion would be highly dangerous. There might hereſy, or the foundation of hereſy, without coming near revelation, or any of the peculiar doctrines of chriſtianity. We muſt only be allowed to *think* for ourſelves, without having the liberty of divulging, or, in any form, publiſhing our thoughts to others, not even to our children. A mighty privilege indeed! and for which we might think ourſelves obliged to Dr. Brown, if it were in the power of man to deprive us of it. This is a privilege which the poor wretch enjoys who lives under the ſame roof with a Spaniſh inquiſitor. The ſubjects of the Grand Seignior enjoy far greater privileges than thoſe which Dr. Brown would indulge to Engliſhmen. For the greater part of them are allowed to educate their children in a religion which teaches them to regard Mohammed

Mohammed as an impoſtor. Nay the Pope himſelf permits thoſe to live unmoleſted, and under his protection at Rome, who look upon that church of which he calls himſelf the head, as founded on fraud and falſehood, and to educate their children in the ſame principles. Nor hath the Pope, or the Grand Seignior, ever ſeen reaſon to repent of their indulgence.

WERE any more laws reſtraining the liberty of the preſs in force, it is impoſſible to ſay how far they might be conſtrued to extend. Thoſe already in being are more than are requiſite, and inconſiſtent with the intereſts of truth. Were they to extend farther, every author would lie at the mercy of the miniſters of ſtate, who might condemn indiſcriminately, upon ſome pretence or other, every work that gave them umbrage; under which circumſtances might fall ſome of the greateſt and nobleſt productions of the human mind, if ſuch works could be produced in thoſe circumſtances. For if men of genius knew they could not publiſh the diſcoveries they made, they could not give free ſcope to their faculties in making and purſuing thoſe diſcoveries. It is the thought of publication, and the proſpect of fame which is, generally, the great incentive to men

men of genius to exert their faculties, in attempting the untrodden paths of ſpeculation.

In thoſe unhappy circumſtances, writers would entertain a dread of every new ſubject. No man could ſafely indulge himſelf in any thing bold, enterprizing, and out of the road of the vulgar; and in all publications we ſhould ſee a timidity incompatible with the ſpirit of diſcovery. If any towering genius ſhould ariſe in thoſe unfavourable circumſtances, a Newton in the natural world, or a Locke, a Hutcheſon, a Clarke, or a Hartley in the moral, the only effectual method to prevent their diffuſing a ſpirit of enterpriſe and innovation, which is natural to ſuch great ſouls, could be no other than that which Tarquin ſo ſignificantly expreſſed, by taking off the heads of all thoſe poppies which overlooked the reſt. Such men could not but be dangerous, and give umbrage in a country where it was the maxim of the government, that every thing of importance ſhould forever remain unalterably fixed.

What might be expected from the buſineſs of education being lodged, by the ſtate, in the hands of any one ſet of men, may be imagined from the alarm which the Newtonian ſyſtem, gave to all philoſophers at

at the time of its firſt publication; and from what paſſed at Oxford with reſpect to Locke's Eſſay on the Human Underſtanding, which has done honour to the Engliſh nation in the eyes of all the learned world. We are told in the life of Mr. Locke, in the Biographia Britannica; that "there "was a meeting of the heads of houſes at "Oxford, where it was propoſed to cen-"ſure and diſcourage the reading of this "Eſſay; and that, after various debates, "it was concluded; that, without making "any public cenſure, each head of a houſe "ſhould endeavour to prevent its being "read in his own college." This paſſed but a little before Mr. Locke's death, about fourteen years after the firſt publication of the Eſſay.

THE whole of this ſyſtem of uniformity appears to me to be founded on very narrow and ſhort-ſighted views of policy. A man of extenſive views will overlook temporary evils, with a proſpect of the greater good which may often reſult from, or be inſeparably connected with them. He will bear with a few tares, leſt, in attempting to root them out, he endanger rooting up the wheat with them. Unbounded free enquiry upon all kinds of ſubjects may

certainly be attended with ſome inconvenience, but it cannot be reſtrained without infinitely greater inconvenience. The deiſtical performances Dr. Brown is ſo much offended at may have unſettled the minds of ſome people, but the minds of many have been more firmly ſettled, and upon better foundations than ever. The ſcheme of chriſtianity has been far better underſtood, ſince thoſe deiſtical writings have occaſioned the ſubject to be more thoroughly diſcuſſed than it had been before.

Besides if truth ſtand upon the falſe foundation of prejudice or error, it is an advantage to it to be unſettled; and the man who doth no more, and even means to do no more, is, in fact, its friend. Another perſon ſeeing its deſtitute and baſeleſs condition, may be induced to ſet it upon its proper foundation. Far better policy would it be to remove the difficulties which ſtill lie in the way of free enquiry, than throw freſh ones into it. Infidels would then be deprived of their moſt ſucceſsful method of attacking chriſtianity, namely, inſinuation; and chriſtian divines might, with a more manly grace, engage with champions of deiſm, and in fact, engage with more advantage, when

when they both fought on the ſame equal ground. As things are at preſent, I ſhould be aſhamed to fight under the ſhelter of the civil power, while I ſaw my adverſary expoſed to all the ſeverity of it.

To the ſame purpoſe, I cannot help quoting the authority of the learned and judicious Dr. Warburton, "Nor leſs "friendly is this liberty to the gene-"rous advocate of religion. For how "could ſuch an one, when in earneſt "convinced of the ſtrength of evidence in "his cauſe, deſire an adverſary whom the "laws had before diſarmed, or value a victory "where the magiſtrate muſt triumph with "him? Even I, the meaneſt in this contro-"verſy, ſhould have been aſhamed of project-"ing the defence of the great Jewiſh legiſla-"tor, did not I know, that his aſſailants and "defenders ſkirmiſhed under one equal "law of liberty. And if my diſſenting, "in the courſe of this defence, from ſome "common opinions needs an apology, I "ſhould deſire it may be thought, that "I ventured into this train with greater "confidence, that I might ſhew, by not "intrenching myſelf in authorized ſpecu-"lations, I put myſelf upon the ſame "footing with you [the Deiſts] and would "claim no privilege that was not enjoyed "in common." Divine Legation, page 7.

But ſorry I am, and ſorry muſt that worthy prelate be, that the paragraph which immediately follows, how proper ſoever it might be when it was written, would *now* look like a tantalizing of his unfortunate adverſaries. "This liberty, "then, may you long poſſeſs, know how "to uſe it, and gratefully to acknowledge. "I ſay this, becauſe one cannot, without "indignation, obſerve, that, amidſt the "full enjoyment of it, you ſtill continue, "with the meaneſt affectation, to fill your "prefaces with repeated clamours againſt "the difficulties and diſcouragements at- "tending the exerciſe of free thinking; "and in a peculiar ſtrain of modeſty and "reaſoning, make uſe of this very liberty "to perſwade the world you ſtill want it. "In extolling liberty we can join with "you, in the vanity of pretending to "have contributed moſt to its eſtabliſh- "ment we can bear with you, but in the "low cunning of pretending ſtill to lie "under reſtraints, we can neither join nor "bear with you. There was indeed, a "time, and that within our memories, "when ſuch complaints were ſeaſonable, "and meritorious; but, happy for you, "gentlemen, you have outlived it. All

"the

" the reſt is merely ſir Martin, it is con-
" tinuing to fumble at the lute though
" the muſic has been long over."

LET Peter Annet (if he dare) write a comment on this paſſage. So far are Deiſts from having free liberty to publiſh their ſentiments, that even many Chriſtians cannot ſpeak out with ſafety. In preſent circumſtances, a chriſtian divine is not at liberty to make uſe of thoſe arguments which, he may think, would ſupply the beſt defence of chriſtianity. What are with many the very foundations of our faith are in a ruinous condition, and muſt be repaired before it will be to any purpoſe to beautify and adorn the ſuperſtructure; but the man who ſhould have the true courage and judgement to go near enough to ſuch rotten foundations would be thought to mean nothing leſs than to under-mine them, and intirely deſtroy the whole fabric. His very brethren would ſtand off from him, and think him in league with with their adverſaries; and, by an ill judg-ing zeal, might call in the help of the ill-directed civil power to ſtop his hand. In conſequence of which, notwithſtanding his moſt laudable zeal in favour of our holy religion, he might ſtand upon the ſame

pillory, and be thrown into the ſame priſon with poor and harmleſs infidels. Many undoubted friends of Chriſtianity, and men of the moſt enlarged minds, will know and feel what I mean.

If any perſon ſhould think that religion is not to be put upon the ſame footing with other branches of knowledge (which they allow to require the aid of every circumſtance favourable to their future growth) that, ſince the whole of Chriſtianity was delivered at once, and is contained in the books of the new Teſtament, there is no reaſon to expect more light than we already have with regard to it; and that they may therefore be juſtified in fixing the knowledge of it where it now ſtands; if they imagine that the objections of Deiſts may injure, but can be no real ſervice to the cauſe, and that, therefore, they ought to be reſtrained; I can only ſay, I ſincerely pity their weakneſs, and prejudice.

HITHERTO, indeed, few of the friends of free enquiry among Chriſtians have been more than partial advocates for it. If they find themſelves under any difficulty with reſpect to their own ſentiments, they complain, and plead ſtrongly for the rights of conſcience, of private judgment, and of free

free enquiry; but when they have got elbow room enough for themſelves, they are quite eaſy, and in no pain for others. The Papiſt muſt have liberty to write againſt Pagans, Mohammedans, and Jews; but he cannot bear with Proteſtants. Writers in defence of the Church of England juſtifiy their ſeparation from the church of Rome, but, with the moſt glaring inconſiſtency, call the Proteſtant Diſſenters ſchiſmatics, and many Diſſenters, forgetting the fundamental principles of their diſſent, which are the ſame that are aſſerted by all Chriſtians and Proteſtants, in ſimilar circumſtances, diſcourage every degree of liberty greater than they themſelves have taken, and have as great an averſion to thoſe they are pleaſed to call Heretics, as Papiſts have for Proteſtants, or as Laud had for the old Puritans.

But why ſhould we confine our neighbour, who may want more room, in the ſame narrow limits with ourſelves. The wider we make the common circle of liberty, the more of its friends will it receive, and the ſtronger will be the common intereſt. Whatever be the particular views of the numerous tribes of ſearchers after truth, under whatever denomination we may be ranked, whether we be called,

or call ourſelves Chriſtians, Papiſts, Proteſtants, Diſſenters, Heretics, or even Deiſts (for all are equal here, all are actuated by the ſame ſpirit, and all engaged in the ſame cauſe) we ſtand in need of the ſame liberty of thinking, debating, and publiſhing. Let us, then, as far as our intereſt is the ſame, with one heart and voice, ſtand up for it. Not one of us can hurt his neighbour, without uſing a weapon which, in the hand of power, might as well ſerve to chaſtiſe himſelf. The preſent ſtate of the Engliſh government (including both the laws, and the adminiſtration, which often corrects the rigour of the law) may, perhaps, bear my own opinions without taking much umbrage; but I could wiſh to congratulate many of my brother free-thinkers, on the greater indulgence which their more heretical ſentiments may require.

To the honour of the Quakers be it ſpoken, that they are the only body of Chriſtians who have uniformly maintained the principles of chriſtian liberty, and toleration. Every other body of men have turned perſecutors when they had power. Papiſts have perſecuted the Proteſtants, the Church of England has perſecuted the Diſſenters; and the Diſſenters, in loſing their name,

name, loſt that ſpirit of chriſtian charity, which ſeemed to be eſſential to them: ſhort was their ſun-ſhine of power, and thankful may Britain, and the preſent Diſſenters be, that it was ſo. But the Quakers, though eſtabliſhed in Penſylvania, have perſecuted none. This glorious principle ſeems ſo intimately connected with the fundamental maxims of their ſect, that it may be fairly preſumed, the moderation they have hitherto ſhown is not to be aſcribed to the ſmallneſs of their party, or to their fear of repriſals. For this reaſon, if I were to pray for the general prevalence of any one ſect of Chriſtians (which I ſhould not think it for the intereſt of chriſtianity to take place, even though I ſhould ſettle the articles of it myſelf) it ſhould be that of the Quakers; becauſe, different as my opinions are from theirs, I have ſo much confidence in their moderation that I believe they would let me live, write, and publiſh what I pleaſed unmoleſted among them. And this I own, is more than I could promiſe myſelf from any other body of chriſtians whatever; the Preſbyterians, perhaps, leaſt of all excepted.

THE object of this forced uniformity is narrow and illiberal, unworthy of human nature. Suppoſing it accompliſhed, what

is

is it poſſible to gain by it, but, perhaps, a more obſtinate and blind belief in the vulgar; while men of ſenſe, ſeeing they are debarred the very means of conviction, muſt of courſe be infidels? In thoſe circumſtances, it would really be an argument of a man's want of ſpirit, of ſenſe, and even of virtue to be a believer. Who would not, with every appearance of juſtice, ſuſpect any cauſe, when he was not allowed to examine the arguments againſt it, and was only preſſed with thoſe in its favour?

WHAT ſenſible and upright judge would decide a cauſe, where all the witneſſes on one ſide were by violence prevented from giving their evidence? Thoſe who converſe with Deiſts (perhaps Dr. Brown never did) well know, that one of their ſtrongeſt objections to Chriſtianity ariſes from hence, that none of the early writings againſt it are preſerved. How much ſtronger, and even unanſwerable, would that objection have been, if Chriſtianity had been, from the beginning, ſo effectually protected by the civil magiſtrate, that no perſon had dared to write againſt it at all. Such friends to the evidence and true intereſts of Chriſtianity are all thoſe who would ſuppreſs Deiſtical writings at this day!

SUPPOSE

SUPPOSE any article in a ſyſtem of faith, ſo eſtabliſhed and guarded, to be wrong, which is certainly a very modeſt ſuppoſition; let Dr. Brown and the other advocates of this ſcheme ſay, how it is poſſible it ſhould ever be rectified: or that, if the truth ſhould inſinuate it ſelf, by any avenue which they had not ſufficiently guarded, how it could bring its evidence along with it, ſo as to command the attention, and acceptance of men of underſtanding.

INDEED, it is not ſo much from the miſtaken friends of truth that we apprehend theſe meaſures of rigid uniformity; but rather from thoſe who would ſacrifice truth, and every other conſideration to public tranquility. From thoſe MERE STATESMEN who, looking upon all ſyſtems of religion to be equally falſe, and not able to bear examination, will not ſuffer that examination to take place, for fear of deſtroying a ſyſtem which, however falſe, they imagine to be neceſſary to the peace and well being of the ſtate. The moſt unrelenting perſecution is to be apprehended, not from bigots, but from infidels. A bigot, who is ſo from a principle of conſcience, may poſſibly be moved by a regard to

the

the conſciences of others; but the man who thinks that conſcience ought always to be ſacrificed to political views, has nothing on which an argument in favour of moderation can lay hold. Was not Bolingbroke the greateſt promoter of the ſchiſm bill in England, and Richlieu of the perſecution of the proteſtants in France?

I ACKNOWLEGE with the ſtateſman, that the proper object of the civil magiſtrate is the peace and well being of ſociety, and that whatever tends to diſturb that peace and well being, properly comes under his cogniſance. I acknowlege ſeveral religious and moral, as well as political principles have a near connection with the well being of ſociety. But there are many caſes, in which the happineſs of ſociety is nearly concerned, in which it would, nevertheleſs, be the greateſt impropriety in the world for the civil magiſtrate to interfere; as in many of the duties of private life, the obligations of gratitude &c. In all ſuch caſes, where the well being of ſociety is moſt nearly concerned, the civil magiſtrate has no right to interfere, unleſs he can do it to good purpoſe. There is no difference, I apprehend, to be made in this caſe, between the right, and the wiſdom of interference.

If

If the interference would be for the good of the ſociety upon the whole, it is wiſe, and right; if it would do more harm than good, it is fooliſh and wrong. Let the ſagacious ſtateſman, therefore, conſider, whether the interference of the civil magiſtrate be, in its own nature, calculated to prevent the violation of the religious and moral principles he may wiſh to enforce. I think it is clear, that when they are in danger of being violated, his preſence is ſo far from tending to remedy the evil, that it muſt neceſſarily inflame it, and make it worſe.

IT is univerſally underſtood, that REASON and AUTHORITY are two things, and that they have generally been oppoſed to one another; the hand of power, therefore, on the ſide of any ſet of principles cannot but be a ſuſpicious circumſtance. And though the injunction of the magiſtrate may ſilence *voices*, it multiplies *whiſpers*, and thoſe whiſpers are the things at which he has the moſt reaſon to be alarmed.

BESIDES, it is univerſally true, that where the civil magiſtrate has the greateſt pretence for interfering in religious and moral principles, his interference (ſuppoſing there were no impropriety in it) is the leaſt neceſſary. If the opinions and principles

ciples in queſtion, be evidently ſubverſive of all religion and all civil ſociety, they muſt be evidently falſe, and eaſy to refute; ſo that there can be no danger of their ſpreading; and the patrons of them may ſafely be ſuffered to maintain them in the moſt open manner they chuſe.

To mention thoſe religious and moral principles which Dr. Brown produces, as the moſt deſtructive to the well being of ſociety; namely, that *there is no God*, and that *there is no faith to be kept with heretics*. So far am I from being of his opinion, that it is neceſſary to guard againſt theſe principles by ſevere penalties, and not to tolerate thoſe who maintain them, that I think, of all opinions, ſurely ſuch as theſe have nothing formidable or alarming in them. They can have no terrors but what the magiſtrate himſelf, by his ill judged oppoſition, may give them. Perſecution may procure friends to any cauſe, and poſſibly to this, but hardly any thing elſe can do it. It is unqueſtionable, that there are more atheiſts and infidels of all kinds in Spain and Italy, where religion is ſo well guarded, than in England; and we are, perhaps, principally indebted to the laws in favour of chriſtianity for what there is of deiſm with us.

FOR my own part, I cannot help thinking the principles of Dr. Brown very dangerous in a free ſtate, and therefore cannot but wiſh they were exterminated. But I ſhould not think that ſilencing him would be the beſt method of doing it. No, let him, by all means, be encouraged in making his ſentiments public; both that their dangerous tendency, and their futility may more clearly appear. Had I the direction of the preſs, he ſhould be welcome to my *imprimatur* for any thing he ſhould pleaſe to favour the world with; and ready, if I know myſelf, ſhould I be, to furniſh him with every convenience in my power for that purpoſe. It is for the intereſt of truth that every thing be viewed in fair and open day light, and it can only be ſome ſiniſter purpoſe that is favoured by darkneſs or concealment of any kind. My ſentiments may be fallacious, but if nobody were allowed to write againſt me, how could that fallacy be made to appear? Be the prayer of the magnanimous Ajax ever mine,

Πομσον δ' αυδρι, δος δ' οφθαλμοισιν ιδεσθαι·
Ευ δε φαει και ολεσσον. Homer. Lib. 17. v. 646.

THIS writer artfully mentions only three opinions or principles, one under each claſs

claſs of Religion, Morals, and Politics, as neceſſary to be guarded by civil penalties, and not to be tolerated; and no doubt he has choſen thoſe principles which a friend to his country would moſt wiſh to have ſuppreſſed, and with regard to which, he would leaſt ſcrupulouſly examine the means that might be uſed to ſuppreſs them. This, Britons, is the method in which arbitrary power has ever been introduced: This is well known to have been the method uſed by the thirty tyrants of Athens. They firſt cut off perſons the moſt generally obnoxious, and ſuch as the ſtanding laws could not reach. And even that intelligent people were ſo far duped by their reſentment, that they were not aware, that the very ſame methods might be employed to take off the worthieſt men in the city. And if ever arbitrary power gain ground in England, it will be by means of the ſeeming neceſſity of having recourſe to illegal methods, in order to come at opinions or perſons generally obnoxious. But when theſe illegal practices have once been authorized, and have paſſed into precedents, all perſons and all opinions will lie at the mercy of the prime miniſter, who will animadvert upon whatever gives him umbrage.

HAPPY would it be for the unſuſpecting ſons of liberty, if their enemies would ſay, at firſt, how far they meant to proceed againſt them. To ſay, as Dr. Brown does, that there are MANY opinions and principles which ought not to be tolerated, and to inſtance only in three, is very ſuſpicious and alarming. Let him ſay, in the name of all the friends of liberty, I challenge him to ſay, how many more he has thought proper not to mention, and what they are; that we may not admit the foot of arbitrary power, before we ſee what ſize of a body the monſter has to follow it.

SUCH is the connection and gradation of opinions, that if once we admit there are ſome which ought to be guarded by civil penalties, it will ever be impoſſible to diſtinguiſh, to general ſatisfaction, between thoſe which may be tolerated, and thoſe which may not. No two men living, were they queſtioned ſtrictly, would give the ſame liſt of ſuch fundamentals. Sure I am, that Dr. Brown and myſelf would differ greatly, were we called upon to give in ours. Far eaſier were it to diſtinguiſh the animal, vegetable, and mineral kingdoms in nature, which yet naturaliſts find to be impoſſible. But a happy circumſtance it is for human ſociety,

that, in religion and morals, there is no neceſſity to diſtinguiſh them at all. The more important will guard themſelves by their own evidence, and the leſs important do not deſerve to be guarded.

POLITICAL principles, indeed, may require penal ſanctions; but then it is for the very ſame reaſon that religious and moral principles require none. It is becauſe they do not carry their own evidence along with them. Governments actually eſtabliſhed muſt guard themſelves by penalties and intolerance, becauſe forms of government, and perſons preſiding in them being nearly arbitrary, it may not be very evident that a different government, or different governors, would not be better for a ſtate. Laws relating to treaſon are to be conſidered as a matter of ſelf-preſervation. But even with reſpect to civil government, it is better not to guard every thing ſo ſtrongly as that no alteration can ever be made in it. Nay, alterations are daily propoſed, and daily take place in our civil government, in things both of great and ſmall conſequence. They are improvements in Religion only that receive no countenance from the ſtate: a fate ſingular and hard!

BESIDES, ſo many are the ſubtle diſtinctions relating to religion and morals, that no

no magiſtrate, or body of magiſtrates, could be ſuppoſed to enter into them; and yet, without entering into them, no laws they could make would be effectual. To inſtance in the firſt of Dr. Brown's principles, and the moſt eſſential of them, viz. the being of a God. The magiſtrate muſt define ſtrictly what he means by the term God, otherwiſe Epicureans and Spinoziſts might be no atheiſts; or Arians or Athanaſians might be obnoxious to the law. The magiſtrate muſt likewiſe puniſh, not only thoſe who directly maintain the principles of Atheiſm (for evaſions are ſo eaſy to find, that ſuch laws would hurt no body) but he muſt puniſh thoſe who do it indirectly; and what opinions are there not, in religion, morals, and even natural philoſophy, which might not be ſaid to lead to Atheiſm? The doctrine of equivocal generation, for inſtance, might certainly be thought of this kind, as well as many others, which have been very harmleſsly maintained by many good chriſtians.

I AM ſenſible, that in the few particulars which Dr. Brown has thought proper to mention, his intolerant principles are countenanced by Mr. Locke; but, as far as I can recollect, theſe are all the opinions

which Locke would not tolerate; whereas this writer aſſerts there are MANY; ſo that he muſt provide himſelf with ſome other authority for the reſt. Beſides, I make no doubt, the great Mr. Locke would, without the leaſt reluctance, give up any of his aſſertions, upon finding ſo bad an uſe made of them, and that the conſequences of them were ſo very unfavourable to his own great object, and contradictory to his leading principles; and that he would, with indignation, give up any adherents to arbitrary power, who, from ſuch a pretence as this, ſhould claim his protection from the generous purſuit of the friends of liberty, of reaſon, and of mankind. And, after all, the controverſy is not about men, but principles. And ſo great an enemy as Mr. Locke was to all authority in matters of opinion, would leaſt of all except his own.

BESIDES, as was in ſome meaſure obſerved before, all theſe ſyſtems of uniformity, in political or religious inſtitutions, are the higheſt injuſtice to poſterity. What natural right have we to judge for them, any more than our anceſtors had to judge for us? Our anceſtors, from the time of the Britons, had, no doubt, as high an opinion of their political and religious inſtitutions as we can have of ours. But ſhould

ſhould we not have thought the fate of Great Britain ſingularly unhappy, if they had been entailed upon us? And the very ſame reaſon of complaint will our poſterity have, if we take any methods to perpetuate what we approve, as beſt for ourſelves in preſent circumſtances; for farther than this we cannot pretend to ſee.

LET us, by all means, make our own circumſtances as eaſy as poſſible; but let us lay poſterity under no difficulty in improving theirs, if they ſee it convenient: rather, let all plans of policy be ſuch as will eaſily admit of extenſion, and improvements of all kinds, and that the leaſt violence, or difficulty of any kind, may attend the making of them. This is, at leaſt, very deſirable, and I believe it is far from being impracticable. However, though it ſhould not be thought proper to unfix any thing which is at preſent eſtabliſhed, let us proceed no farther than is manifeſtly neceſſary in thoſe eſtabliſhments.

LET it be carefully noted, that I am by no means pleading againſt religious eſtabliſhments in general, nor mean to hint any thing diſreſpectful of that which prevails in this nation; but only argue againſt fixing every thing ſo unalterably, that if a

change, in any particular, ſhould be deſired by a great majority of the clergy themſelves, they ſhould not be able to accompliſh it, without the danger of throwing every thing into confuſion. Such rigid eſtabliſhments imply the authors of them to be well perſwaded of their own infallibility. For no man, who could ſuppoſe it poſſible for himſelf to be miſtaken, would think it was reaſonable, that, after the miſtake was diſcovered, and univerſally acknowledged to be a miſtake, all perſons (if they would enjoy the advantage of the eſtabliſhment) ſhould ever after be obliged to affirm, that they believed it to be no miſtake, but perfectly agreeable to truth.

How far this is the caſe with the church of England, let thoſe of her clergy ſay, who may underſtand the ſubject of religion a little better than the firſt reformers, juſt emerging from the darkneſs of popery, who may have ſome reluctance to ſubſcribe what they do not believe, and who may feel, notwithſtanding every evaſion to which they can have recourſe, that a church preferment is dearly bought at the expence of a ſolemn falſehood. I do not appeal to thoſe who may really believe all they ſubſcribe, or to thoſe who may ſubſcribe without

out thinking at all, or to thoſe who would wait upon any miniſter of ſtate in the world with a carte blanche ready ſigned. In ſaying this, I even hint no more than what many of the greateſt ornaments of the church have ſaid again and again; that ſome things, in our preſent eſtabliſhment, are wrong, and want reformation; and that there are thinking and unthinking, honeſt and diſhoneſt men in this, as well as in every other profeſſion.

POSTERITY, it may be ſaid, will never complain of our inſtitutions, when they have been educated in a ſtrong and invincible attachment to them. It is true, and had we been Pagans or Papiſts, through a ſimilar ſyſtem of education, fixed in a more early period, we ſhould not have complained. We, like the old Spartans, or the ſons of bigotry in Spain and Portugal at preſent, might have been hugging our chains, and have been proud of them. But perſons who could have made a compariſon between our actual condition, and what it would have been, had thoſe inſtitutions not been made, would have complained for us. They would have ſeen us to be a leſs great, wiſe, and happy people; which affords the ſame argument againſt

throwing difficulties in the way of future improvements.

HIGHLY as we think of the wiſdom of our anceſtors, we juſtly think ourſelves, of the preſent age, wiſer, and, if we be not blinded by the mere prejudice of education, muſt ſee, that we can, in many reſpects, improve upon the inſtitutions they have tranſmitted to us. Let us not doubt, but that every generation in poſterity will be as much ſuperior to us in political, and in all kinds of knowledge, and that they will be able to improve upon the beſt civil and religions inſtitutions that we can preſcribe for them. Inſtead then of adding to the difficulties, which we ourſelves find in making the improvements we wiſh to introduce, let us make this great and deſirable work eaſier to them than it has been to us.

HOWEVER, ſuch is the progreſs of knowledge, and the enlargement of the human mind, that, in future time, notwithſtanding all poſſible obſtructions thrown in the way of human genius, men of great and exalted views will undoubtedly ariſe, who will ſee through and deteſt our narrow politics; when the ill-adviſers, and the ill-adviſed authors of theſe illiberal, and contracted ſchemes will be remembered

remembered with infamy and execration: when, notwithſtanding their talents as ſtateſmen or writers, and though they may have purſued the ſame mind-enſlaving ſchemes by more artful, and leſs ſanguinary methods, they will be ranked among the Bonners and the Gardiners of paſt ages. They muſt have been worſe than Bonners or Gardiners, who could purſue the ſame ends by the ſame means, in this more humane and more enlightened age.

THIS ſeems to be the time, when the minds of men are opening to large and generous views of things. Politics are more extended in practice, and better underſtood in theory. Religious knowledge is greatly advanced, and the principle of univerſal toleration is gaining ground apace. Schemes of eccleſiaſtical policy, which, in times of barbarity, ignorance, and ſuperſtition were intimately interwoven with ſchemes of civil policy, and which, in fact, made the greateſt part of the old political mixed conſtitution, have been gradually excluded; 'till, at preſent, though eccleſiaſtical power be looked upon as an uſeful ſupport and auxiliary of civil government, it is pretty much detached from it. And the more ſenſible part of mankind are evidently in a progreſs to the belief,

that

that eccleſiaſtical and civil juriſdiction, being things of a totally different nature, ought if poſſible, to be wholly diſengaged from one another. Religious ſentiments, with reſpect to their influence on civil ſociety, will perhaps be regarded, in time, as a theory of morals, only of a higher and more perfect kind, excellent to enforce a regard to magiſtracy, and the political duties, but improperly adopted into the ſame ſyſtem, and enforced by the ſame penalties. Till we know whether this work, which ſeems to be going forward in ſeveral parts of Europe, be of God, or not, let us not take, at leaſt any rigid and violent methods to oppoſe it, but patiently wait the iſſue; unleſs, in the mean time, the diſorders of the ſtate abſolutely force us into violent meaſures. At preſent notwithſtanding ſome trifling alarms, perhaps artfully raiſed and propagated, may ſeem to give a handle to the friends of arbitrary power to make uſe of ſome degree of coercion, more gentle meaſures ſeem better adapted to enſure tranquility.

ENGLAND hath hitherto taken the lead in almoſt every thing great and good, and her citizens ſtand foremoſt in the annals of fame, as having ſhaken off the fetters which hung upon the human mind, and called

called it forth to the exertion of its nobleſt powers. And her conſtitution has been ſo far from receiving any injury from the efforts of theſe her free born enterpriſing ſons, that ſhe is, in part, indebted to them for the unrivalled reputation ſhe now enjoys, of having the beſt ſyſtem of policy in Europe. After weathering ſo many real ſtorms, let us not quit the helm at the apprehenſion of imaginary dangers, but ſteadily hold on in what, I truſt, is the moſt glorious courſe that a human government can be in. Let all the friends of liberty and human nature join to free the minds of men from the ſhackles of narrow and impolitic laws. Let us be free ourſelves, and leave the bleſſings of freedom to our poſterity.

SECTION

SECTION IV.

HITHERTO I have argued againſt eſtabliſhed methods of education upon general principles, ſhowing how unfavourable they are to the great ends of all civil ſocieties, and how they would tend to interrupt their progreſs towards a more perfect ſtate than they have yet arrived to, with only occaſional references to the Engliſh conſtitution. And in theſe arguments, I have likewiſe ſuppoſed theſe methods of education, whatever they are, actually eſtabliſhed, and to have operated to their full extent. I ſhall now add, that, before theſe methods can be eſtabliſhed, and produce their full effect, they muſt occaſion a very conſiderable alteration in the Engliſh conſtitution, and almoſt inevitably deſtroy the freedom of it; ſo that the

the thing which would, in fact, be perpetuated, would not be the preſent conſtitution of England, but ſomething very different from it, and more deſpotic. An alteration of ſo great importance, which tends to defeat one of the principal objects of the Engliſh government, cannot but give juſt cauſe of alarm to every friend of the preſent happy conſtitution and liberties of this country. In ſupport of this aſſertion, I deſire no other argument than that with which Dr. Brown himſelf furniſhes me, from the influence he allows to education, operating, likewiſe, in the very manner which he deſcribes, and to the very end for which he adviſes the eſtabliſhment of its mode.

EDUCATION is conſidered by the Dr. only in a political view, as uſeful to inſtil into the minds of youth particular maxims of policy, and to give them an attachment to particular forms of it; or as tending to ſuperinduce ſuch habits of mind, and to give ſuch a general turn of thinking, as would correſpond with the genius of a particular ſtate. This education he would have to be univerſal and uniform, and indeed, if it were not ſo, it could not poſſibly anſwer the end propoſed. It muſt, there-

fore,

fore, be conducted by one ſet of men. But it is impoſſible to find any ſet of men, who ſhall have an equal regard to all the parts of our conſtitution; and whatever part is neglected in ſuch a ſyſtem of education can not fail to be a ſufferer.

The Engliſh government is a mixture of regal, ariſtocratical, and democratical power; and if the public education ſhould be more favourable to any one of theſe than to another, or more than its preſent importance in the conſtitution requires, the balance of the whole would neceſſarily be loſt. Too much weight would be thrown into ſome of the ſcales, and the conſtitution be overturned. If the Commons, repreſenting the body of the people, had the choice of theſe public inſtructors, which is almoſt impoſſible, we ſhould ſee a republic riſe out of the ruins of our preſent government; if the Lords, which is highly improbable, we ſhould, in the end, have an ariſtocracy; and if the court had this nomination, which it may be taken for granted would be the caſe (as all the executive power of the ſtate is already lodged in the hands of the ſovereign) it could not but occaſion a very dangerous acceſſion of power to the crown, and we might juſtly expect a ſyſtem of education,

principles,

principles, and manners favourable to deſpotiſm. Every man would be educated with principles, which would lead him to concur with the views of the court. All that oppoſition from the country, which is ſo ſalutary in this nation, and ſo eſſential to the liberties of England, would be at an end. And when once the ſpirit of deſpotiſm was thus eſtabliſhed, and had triumphed over all oppoſition, we might ſoon expect to ſee the forms of it eſtabliſhed too, and thereby the very doors ſhut againſt old Engliſh liberty, and effectually guarded againſt the poſſibility of its return, except by violence; which would then be the only method of its re-entrance.

It is evident to common underſtanding, that the true ſpirit and maxims of a mixed government can no otherwiſe be continued, than by every man's educating his children in his own way; and that if any one part provided for the education of the whole, that part would ſoon gain the aſcendency in the whole; and, if it were capable of it, would become the whole. Were a ſtate, for inſtance, to conſiſt of Papiſts and Proteſtants, and the Papiſts had the ſole power of education, proteſtantiſm would expire with that generation: whereas

whereas, if the Papiſts and Proteſtants educated each their own children, the ſame proportion would continue to ſubſiſt between them, and the balance of power would remain the ſame. For the ſame reaſon the only method of preſerving the balance, which at preſent ſubſiſts among the ſeveral political and religious parties in Great Britain, is for each party to provide for the education of their own children.

In this way, there will be a fair proſpect of things continuing nearly upon their preſent footing, for a conſiderable time; but ſubject to thoſe gradual alterations which, it may be hoped, will prove favourable to the beſt intereſts of the ſociety upon the whole. Whereas, were the direction of the whole buſineſs of education thrown into the hands of the court, it would be ſuch an acceſſion of power to the regal part of our conſtitution, as could not fail to alarm all the friends of civil liberty; as all the friends of religious liberty would be juſtly alarmed, if it ſhould devolve upon the eſtabliſhed clergy. And it were the greateſt injuſtice to the good ſenſe of free born Britons, to ſuppoſe the noble ſpirit of religious liberty, and a zeal for the rights of

of free enquiry confined within the narrow circle of Proteſtant Diſſenters.

I DOUBT not, the wiſeſt and the moſt worthy of the Engliſh prelates would rather ſee the privileges of the Diſſenters enlarged than abridged, in any important article; for, allowing our diſſent to be ever ſo unreaſonable, there is no man, who has the leaſt knowledge of hiſtory or of human nature, but muſt be ſenſible, that the very diſtinguiſhed reputation which the body of the Engliſh clergy enjoy at preſent is, not a little, owing to the exiſtence, and reſpectable figure of the Proteſtant Diſſenters. Several of the moſt diſcerning of the Engliſh biſhops have given their teſtimony, directly or indirectly, to this truth; particularly, if I remember right, biſhop Gibſon, in his charges to the clergy of his dioceſs. The preſent ſtate of the diſſenting intereſt can give no alarm to the eſtabliſhed clergy with reſpect to their temporalities; and, certainly, the intereſts of religious knowledge, which all wiſe and good men of every denomination have moſt at heart, cannot fail to be promoted by that ſpirit of emulation, which will always ſubſiſt betwixt ſcholars and writers in two oppoſite perſuaſions.

THERE is no power on earth, but has grown exorbitant when it has met with no control. What was the character of the Romiſh clergy before the reformation? how ſhamefully ignorant, imperious, lazy, and debauched were the bulk of them; whereas very great numbers of them are now ſenſible, moderate, and virtuous; and little, in compariſon, of the old leaven remains except in Spain and Portugal, where the clergy have no intercourſe with Proteſtants, which might call forth an exertion of their faculties, and check the extravagance of their appetites and paſſions. To ſay that the Engliſh clergy, in future time, would not run into the vices, and ſink into the contempt, into which the Romiſh clergy were ſunk before the reformation, when they were in the ſame circumſtances, would be to ſay they were not men.

IT is Puffendorf, I think, who accounts for the great ſuperiority of the Engliſh clergy over the Swediſh upon this principle. In Sweden, though it be a proteſtant country, no diſſenters are allowed; and their clergy have never produced anything, in Ethics or Divinity, which deſerves notice. Whoever made the obſervation, there is no doubt of the fact.

A FEW narrow minded, and ſhort-ſighted bigots, among the inferior clergy, may wiſh the extinction of the diſſenting intereſt, and might be ready to gratify their hatred and blind zeal, by perſecuting thoſe of their brethren whoſe conſciences are, unhappily, a little more tender than their own; but, certainly, there would not be wanting, in this age, men enow of more humanity, of juſter ſentiments, and of more enlarged views, among the higher ranks in the church, who would, with indignation, ſnatch the torch from their miſguided hands. Their low talents were better confined to a humbler ſphere, in which the fire of their little ſouls might very harmleſſly vent itſelf in occaſional declamatory invectives, which would only ſerve to ſhew the malignity of their own tempers, or the meanneſs and impotence of bigotry, and make all men of ſenſe more in love with the true principles of chriſtian moderation. The indelible infamy which would, to the lateſt poſterity, purſue the man, who ſhould form, countenance, or even connive at, perſecuting meaſures, in this age of moderation and good ſenſe, will effectually deter men of underſtanding, and of a juſt knowlege of the world from theſe meaſures; and it is hoped, that men of zeal

without knowledge will want abilities and influence to carry ſuch ſchemes into execution.

No nation ever was, or can be truly great, powerful, and happy by purſuing oppreſſive and perſecuting meaſures. And a ſovereign, who has a true ſenſe of his preſent and future glory, muſt ſee it to ariſe from his being at the head of a great, powerful, and happy nation, made, or continued ſo, by himſelf. His beſt friends are thoſe who would raiſe his greatneſs, by augmenting the greatneſs of the people over whom he preſides. He himſelf muſt ſee the abſurdity of every ſcheme which propoſes to raiſe his character at the expence of that of his country; as if it were poſſible to depreſs the people to the condition of ſlaves, without ſinking the ſovereign into a maſter of ſuch ſlaves. Poor pre-eminence! Such maxims may have influence with Aſiatic monarchs, but can never impoſe on a ſovereign of Great Britain, educated in Britiſh principles, and with juſt regard to the privileges of his ſubjects, with which his own true dignity is inſeparably connected.

The nation will execrate, and the diſcerning prince will ſee through, and deteſt the meanneſs of that adulation, which, however

however diſguiſed, would tend to enſlave the kingdom, and debaſe the king. The meaneſt tool of the meaneſt party may exclaim againſt licentiouſneſs and faction; men of genius, learning, and integrity may, through the force of prejudice, be induced to join in the cry; and courtiers may think to recommend themſelves to a ſovereign by any meaſures which tend to quiet the clamours of the people; but the true enemy of ſedition, and he who moſt effectually pays his court to a wiſe and good prince, is the man, who, without any views of preferment, propoſes, with a manly freedom, whatever he thinks conducive to the greatneſs and glory of his country. This conduct cannot fail, both to give ſatisfaction to his fellow citizens, and enſure him the eſteem of his prince: becauſe ſuch meaſures will proportionably raiſe the luſtre of all ranks of men in the ſtate, will make a wiſe prince the idol of a grateful nation, and endear his memory to the lateſt poſterity.

F I N I S.

THE

CONTENTS.

PAGE 1. AN ESSAY ON A COURSE OF LIBERAL EDUCATION FOR CIVIL AND ACTIVE LIFE.

A general view of the preſent ſtate of education, with the reaſons of it, deduced from the ſituation of things in former times. 3 *The conſequence of that former ſituation, and of the form of education adapted to it.* 4 *How the ſituation of things has been changed of late years, urged as a reaſon for a change in our ſyſtem of education.* 5 *The reaſon of the little attention that is often given to the preſent courſe of ſtudies, by gentlemen intended for active life.* 7 *Propoſal for improvements in the courſe of education for civil and active life.* 8 *What are the departments of active life.* 10. *New courſes of ſtudy propoſed.* 11. *The ſtudy of hiſtory*

hiſtory and general policy recommended, peculiarly uſeful to gentlemen who intend to travel. 13. *Lectures on the hiſtory of England, and on the laws and conſtitution of England recommended.*

P. 14. *The objection to theſe ſtudies, as too deep and difficult for young perſons, anſwered.* 16. *The advantage of a methodical inſtruction in them pointed out.* 17. *How this kind of knowledge qualifies young gentlemen to enter into ſenſible converſation, and how converſation will come in aid of their lectures.* 18. *What branches of knowledge are requiſite, or uſeful, previous to a young gentleman's entering upon theſe ſtudies.* 19. *The objection that a turn for ſpeculation unfits men for buſineſs conſidered.* 21. *The objection to theſe ſtudies from their engaging too much the attention of ſtudents for the learned profeſſions.* 22. *The great revolution in the ſtate of learning in modern times, and the neceſſity of ſome alteration in the courſe of learned education correſponding to it.* 26. *Studies which formerly engroſſed the attention of divines now ſuperſeded.* 28. *The method in which theſe ſtudies may be taught with the moſt advantage.* 30. *The objection to the encouragement given to ſtudents of propoſing objections, and entering into converſation with the tutor upon them at the time*

time of lecturing. 32 *The advantage which may ariſe to this nation is future times from a general application to theſe ſtudies.*

P. 38. A SYLLABUS OF A COURSE OF LECTURES ON THE STUDY OF HISTORY AND GENERAL POLICY. 67 *An attention to* COMMERCIAL GEOGRAPHY *recommended.*

P. 69 *The* INTRODUCTORY ADDRESS *to a courſe of lectures on the hiſtory of England, explaining the uſes of the ſtudy.*

P. 76 A PLAN OF A COURSE OF LECTURES ON THE HISTORY OF ENGLAND.

P. 85 *The* INTRODUCTORY ADDRESS *to a courſe of lectures on the conſtitution and laws of England, ſhowing the uſes of the ſtudy.*

P. 99 A SYLLABUS OF A COURSE OF LECTURES ON THE CONSTITUTION AND LAWS OF ENGLAND.

P. 137. REMARKS ON A PROPOSED CODE OF EDUCATION;

The ſcheme of Dr. Brown repreſented, and the general diviſion of the ſubject.

SECTION I.

P. 143 A legal Code of Education ſhown to interfere with the proper deſign

of Education, as having for its object the forming of wise and virtuous men.

P. 144. *Education considered as an art, which is as yet in an imperfect state, requiring the aid of every circumstance favourable to its improvement.* 146. *What would have been the consequence, if the method of Education had been fixed in a much earlier period.* 147. *No other arts have been brought to perfection, but in consequence of unbounded liberty in the exercise of them.* 149. *An uniform national character (the consequence of an uniform method of education) not definable. Uniformity the characteristic of the brute creation.*

SECTION II.

P. 152. The scheme of an established method of education shown to be prejudicial to the great ends of civil society.

P. 153. *The happiness of domestic life would be endangered by it.* 154. *What natural rights ought not to be sacrificed to the ends of civil society.* 155. *Some trusts are of God, and not to be relinquished at the command of man.* 156. *A measure similar to this of Dr. Brown's was the severest part of the persecution of the Protestants in France, and of the Jews in Portugal.* 157. *A measure*

ſure ſimilar to this was adopted by Julian, with a view to extirpate Chriſtianity; and by the Tory miniſtry in the latter end of the reign of Queen Ann, to ſuppreſs the Diſſenters. 158. *The difficulty of carrying this ſcheme into execution conſidered.*

SECTION III.

P. 161 An eſtabliſhed method of education would tend to interrupt the progreſs of civil ſocieties to a ſtate of greater perfection than they have yet arrived to.

P. 161 *The imperfections of all civil ſocieties, and of the ſcience of civil government.* 162 *Sparta was a great ſufferer by thoſe inſtitutions which contributed to its longevity.* 164 *The authority of Plutarch and of the ancients of no weight in this caſe.* 165. *What would have been the conſequence, if this ſyſtem had taken place in any earlier period of the Engliſh hiſtory.* 166. *The eaſy remedies provided, in the conſtitution of nature, for diſorders of all kinds.* 167. *The neceſſity of giving liberty to every thing which is in a ſtate of growth.* 168. *What religion has ſuffered for want of it.* 169. *The intention of divine providence to lead mankind to happineſs in a progreſſive method, explained and recommended to our imitation.* 173. *Dr.*

Brown's ſcheme unfavourable to improvements in knowledge, particularly religious knowledge. His complaint of the toleration of Deiſtical writings conſidered. 175. *The conſequence of putting farther reſtraints upon the liberty of the preſs.*

P. 177. *The whole ſyſtem of uniformity founded on narrow and ſhort-ſighted views of policy.* 178. *Chriſtianity has been a gainer by the late deiſtical performances.* 179. *Dr. Warburton quoted in favour of freedom of inquiry.* 181. *Chriſtianity requires to be treated with the greateſt freedom.* 182. *The generality of Chriſtians only partial advocates for free inquiry.* 184. *The Quakers commended.* 185. *A blind belief in the vulgar, and the infidelity of men of ſenſe, the conſequence of a forced uniformity.* 187. *Who are the moſt unrelenting perſecutors.* 188. *Religion is not a thing in which the civil magiſtrate can interfere to good purpoſe.* 189. *Where he has the greateſt pretence for interfering, there is the leaſt neceſſity for it.* 191 *Dr. Brown's art, in aſſerting that there are* many *opinions or principles which ought not to be tolerated, and mentioning only* three. 193. *The inconvenience of attempting to diſtinguiſh between opinions which may be tolerated, and thoſe which may not.* 194. *The reaſon why political, and not religious principles*

ciples require to be guarded by civil penalties. 195. *There are too many ſubtle diſtinctions in religion for any civil magiſtrate to attend to them.* 196. *Syſtems of uniformity injurious to poſterity.* 200. *In what light the promoters of rigid uniformity in religion will, probably, be regarded in future time.*

SECTION IV.

P. 204. ESTABLISHED methods of education ſhown to be inconſiſtent with the principles of the Britiſh conſtitution, and to tend to the deſtruction of it.

P. 206. *The direction of the whole buſineſs of education improperly truſted in the hands of any one of the civil orders of the ſtate.* 288. *Alſo improperly truſted with the eſtabliſhed clergy.* 209. *Advantages accruing to the eſtabliſhed clergy from the Diſſenting intereſt.* 210. *The ſtate of the Romiſh clergy before and after the reformation----of the Swediſh clergy.* 211. *Bigotry chiefly confined to a few of the inferior clergy.* 212. *Oppreſſive and proſecuting meaſures inconſiſtent with the greatneſs and happineſs of a nation.*

A ſhort ACCOUNT of a

CHART of BIOGRAPHY.

THE Chart of Biography, of which the plate annexed exhibits a ſpecimen, is about three feet in length, and two feet in breadth. It repreſents the interval of time between the year 1200 before Chriſt, and 1800, after Chriſt, divided, by an equal ſcale, into centuries. It contains above two thouſand names, the moſt diſtinguiſhed in the annals of fame; and the length of their lives is repreſented in it by lines drawn in proportion to their real duration, and placed ſo as to ſhew, by inſpection, how long any number of perſons were cotemporary, and how long one life began before, or extended beyond another, with every other circumſtance which depends upon the length of lives, and the relation they bear both to one another, and to univerſal time; certainty being always repreſented by full lines, and uncertainty by dots, or broken lines. The names are, moreover, diſtributed into ſeveral claſſes, by lines running the whole length of the Chart, and the chronology is noted in one margin by the year before and after Chriſt, and in the other by ſucceſſions of kings.

As

As an example of the use of the chart, let any person but attend to the black line which represents the life of SIR ISAAC NEWTON. He will see, by the length and situation of it, that that great man was born before the middle of the seventeenth century, and lived till near the middle of the eighteenth. He was born a few years after the death of LORD BACON, and about as many before that of DESCARTES. He was a younger man than BOYLE, whom he outlived many years; and SIR HANS SLOANE, MONTFAUCON, ROLLIN, BENTLEY, and LE CLERC lived to about his age, and were his contemporaries the greatest part of his life. Almost any number of lives may be compared with the same ease, to the same perfection, and in the same short space of time.

The Chart, it may easily be imagined, cannot be equally well filled in all places: but the void spaces, among the groups of great names, will serve to give an idea of the great interruptions of science, and the intervals at which any branch of it has flourished. Many other uses of the Chart are pointed out in the description that is given along with it; which contains every thing necessary in order perfectly to understand the construction of it, and the disposition of the names in it. The

CHART OF BIOGRAPHY.

The work is inſcribed to the late Lord Willoughby of Parham; and though his Lordſhip died juſt before the publication of the firſt edition, it is well known to many perſons, not only that the author had permiſſion to inſcribe this work to his Lordſhip, but that it was chiefly owing to his Lordſhip's approbation and encouragement that he was firſt induced to make it public.

The Price of the Chart, together with a book, containing a DESCRIPTION of it, and a CONTINUATION, on a ſmaller ſcale, as high as the Creation, and A CATALOGUE of all the names inſerted in it, with the DATES annexed to them, is *half a guinea*.

It is printed for the Author, and ſold by himſelf in Warrington; and by Mr. J. Bowles in Cornhill, and T. Jefferies in the Strand, London.